

APPENDIX 2

Spectra Relevant to Chapter 1:

Lewis Acid Mediated (3 + 2) Cycloadditions of

Donor–Acceptor Cyclopropanes with Heterocumulenes

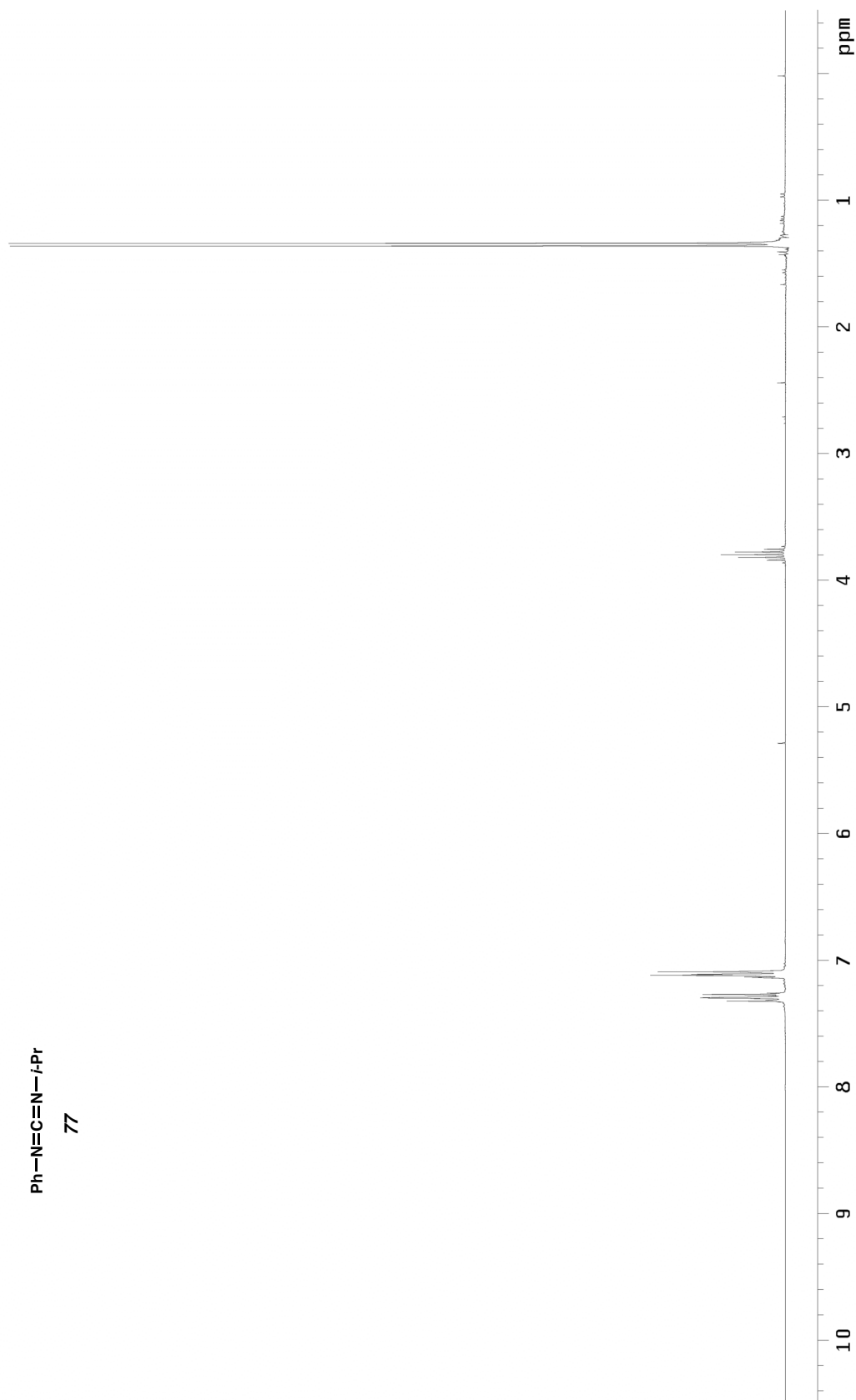


Figure A2.1 ^1H NMR (300 MHz, CDCl_3) of compound 77

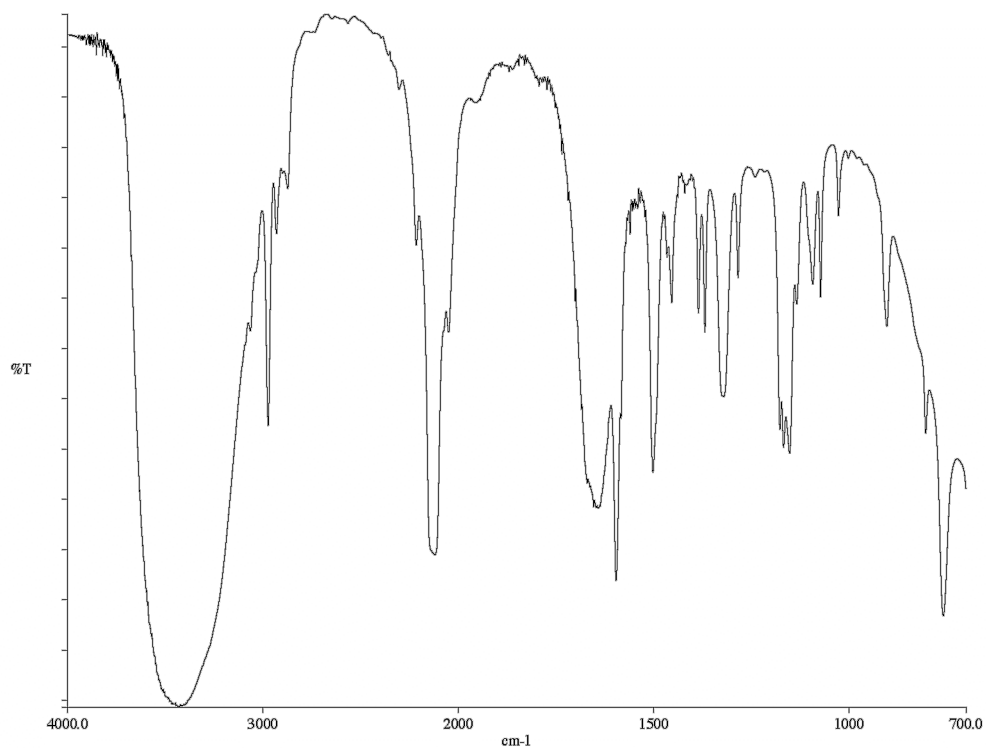


Figure A2.2 Infrared spectrum (thin film/NaCl) of compound **77**

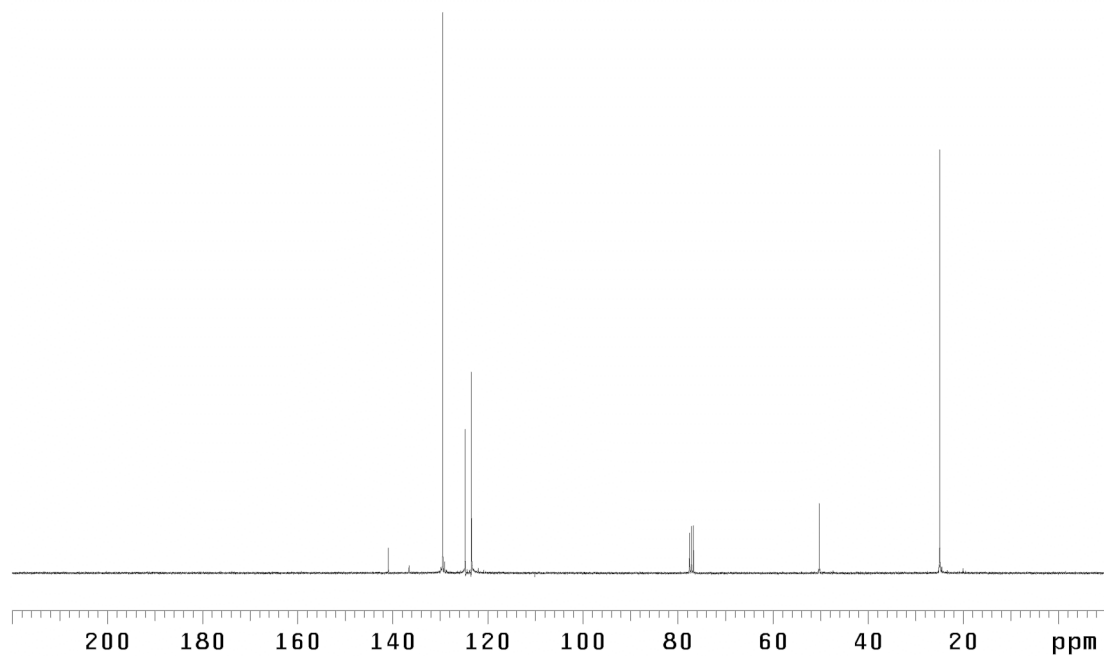


Figure A2.3 ¹³C NMR (75 MHz, CDCl₃) of compound **77**

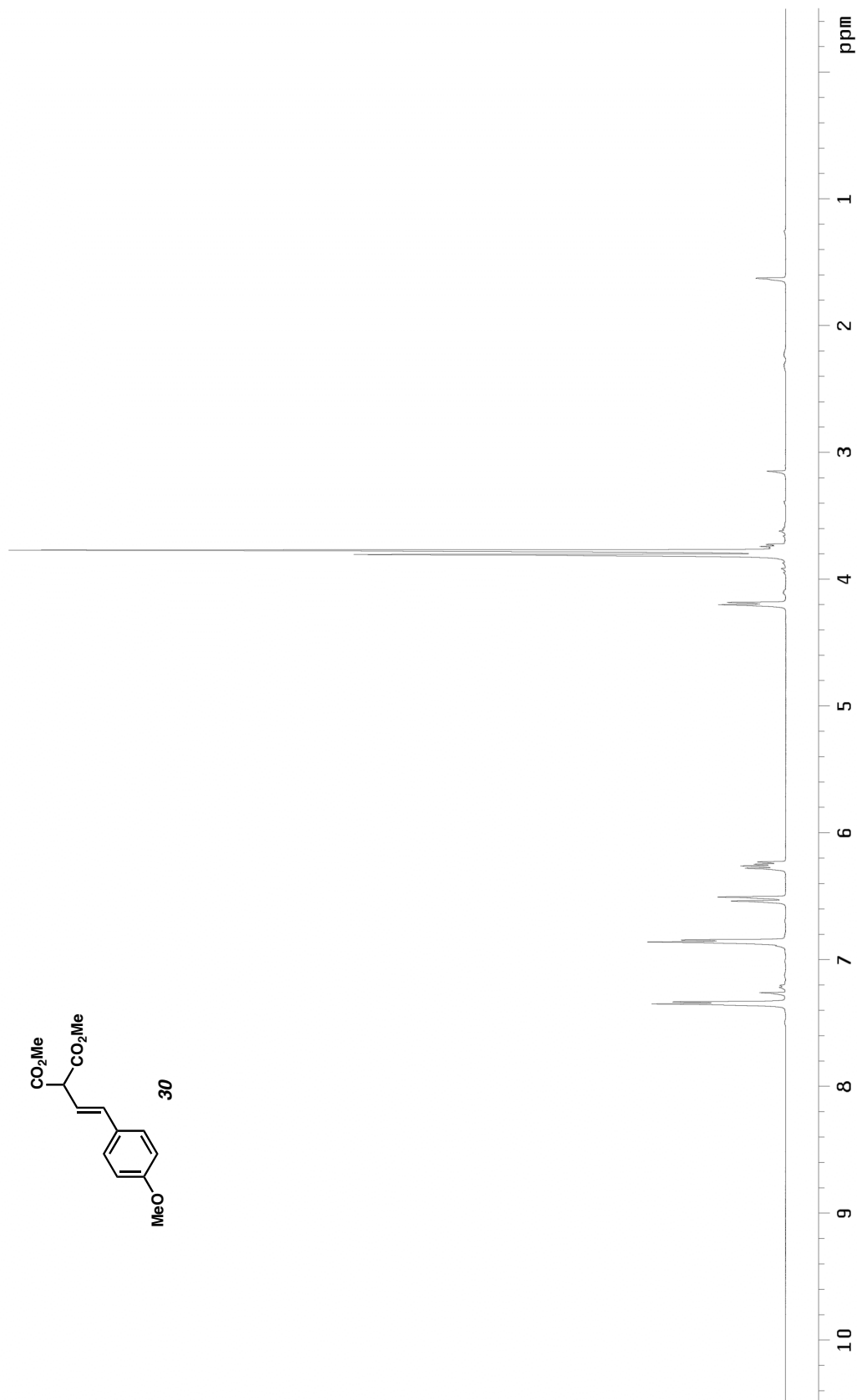


Figure A2.4 ^1H NMR (500 MHz, CDCl_3) of compound **30**

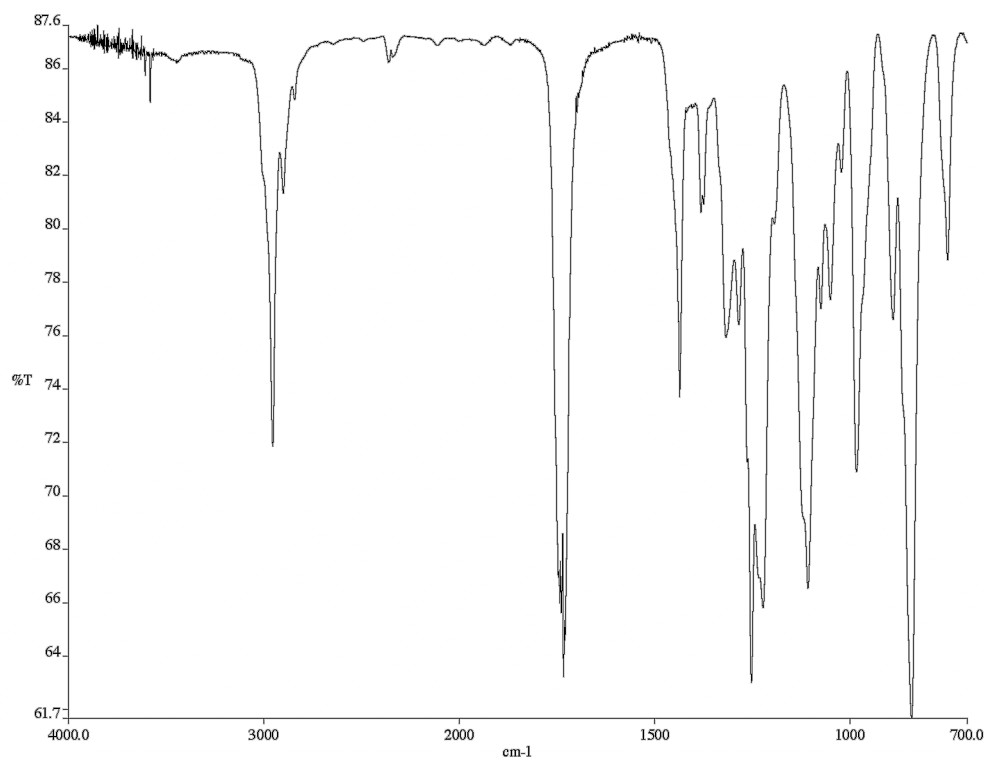


Figure A2.5 Infrared spectrum (thin film/NaCl) of compound **30**

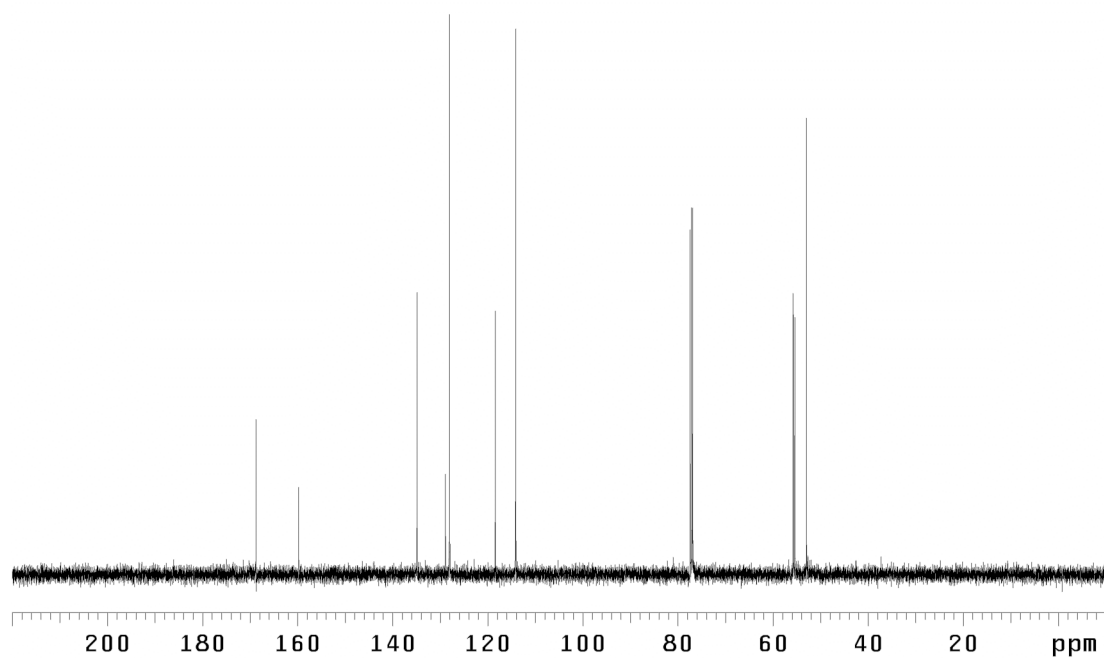


Figure A2.6 ¹³C NMR (126 MHz, CDCl₃) of compound **30**

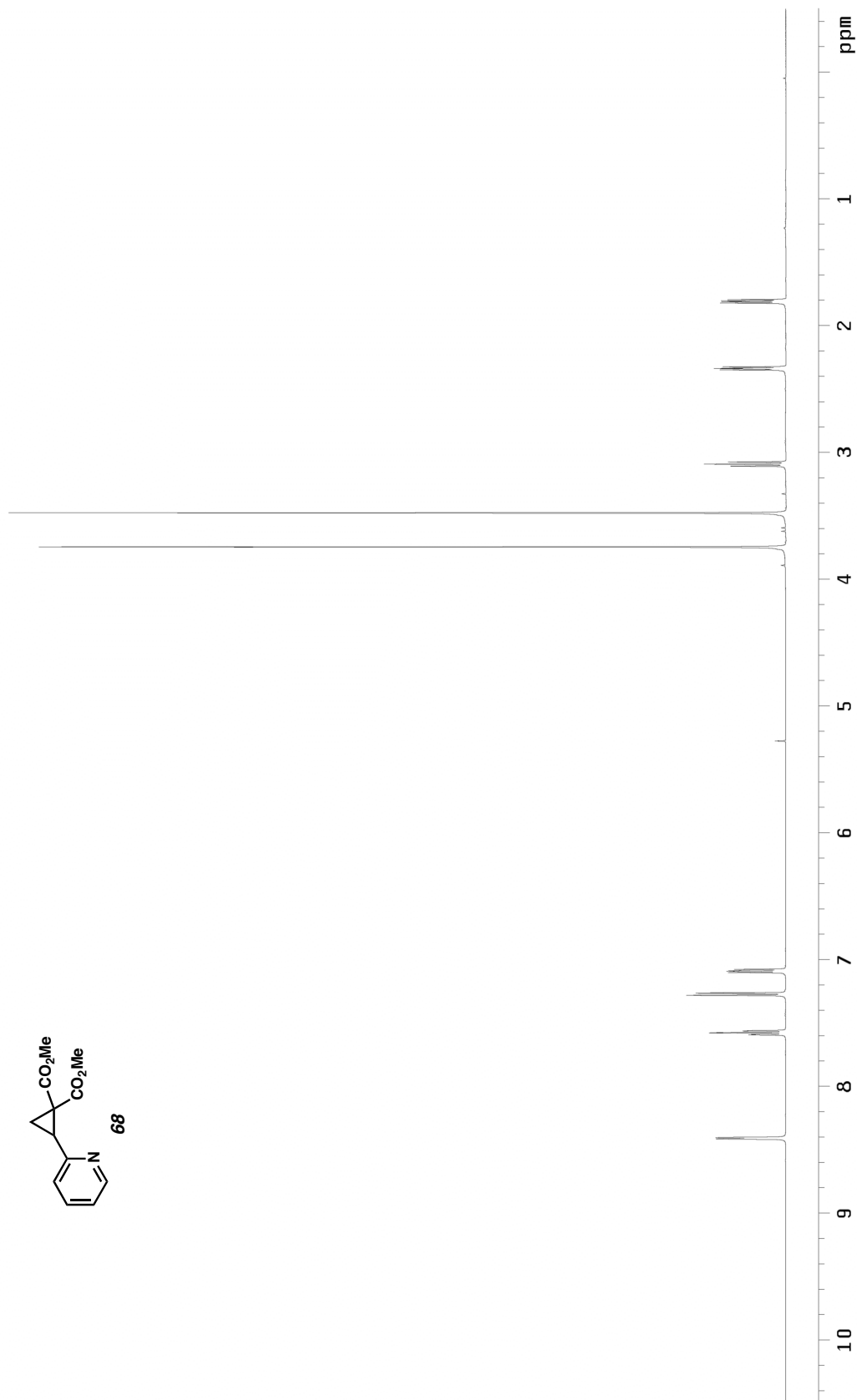


Figure A2.7 ¹H NMR (500 MHz, CDCl₃) of compound **68**

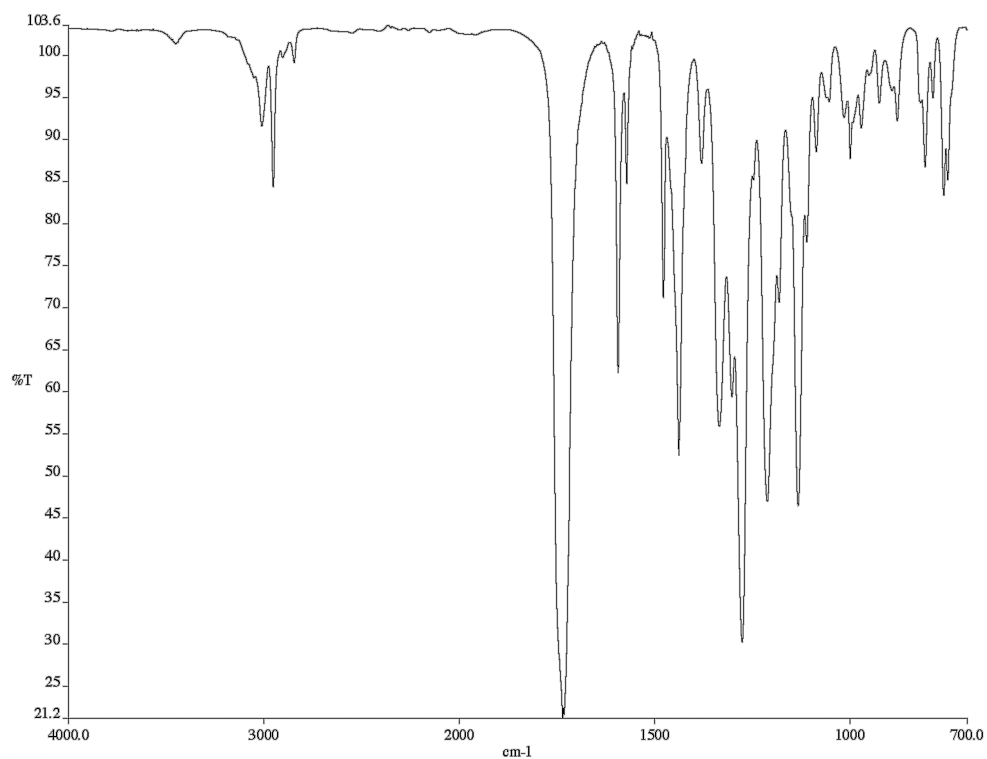


Figure A2.8 Infrared spectrum (thin film/NaCl) of compound **68**

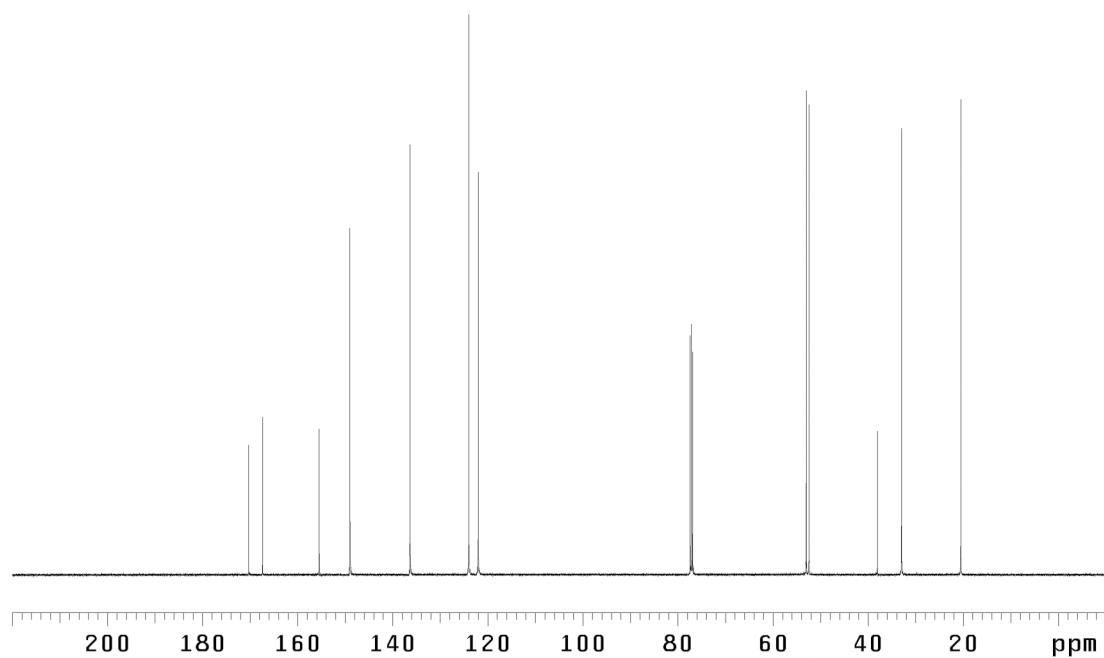


Figure A2.9 ¹³C NMR (126 MHz, CDCl₃) of compound **68**

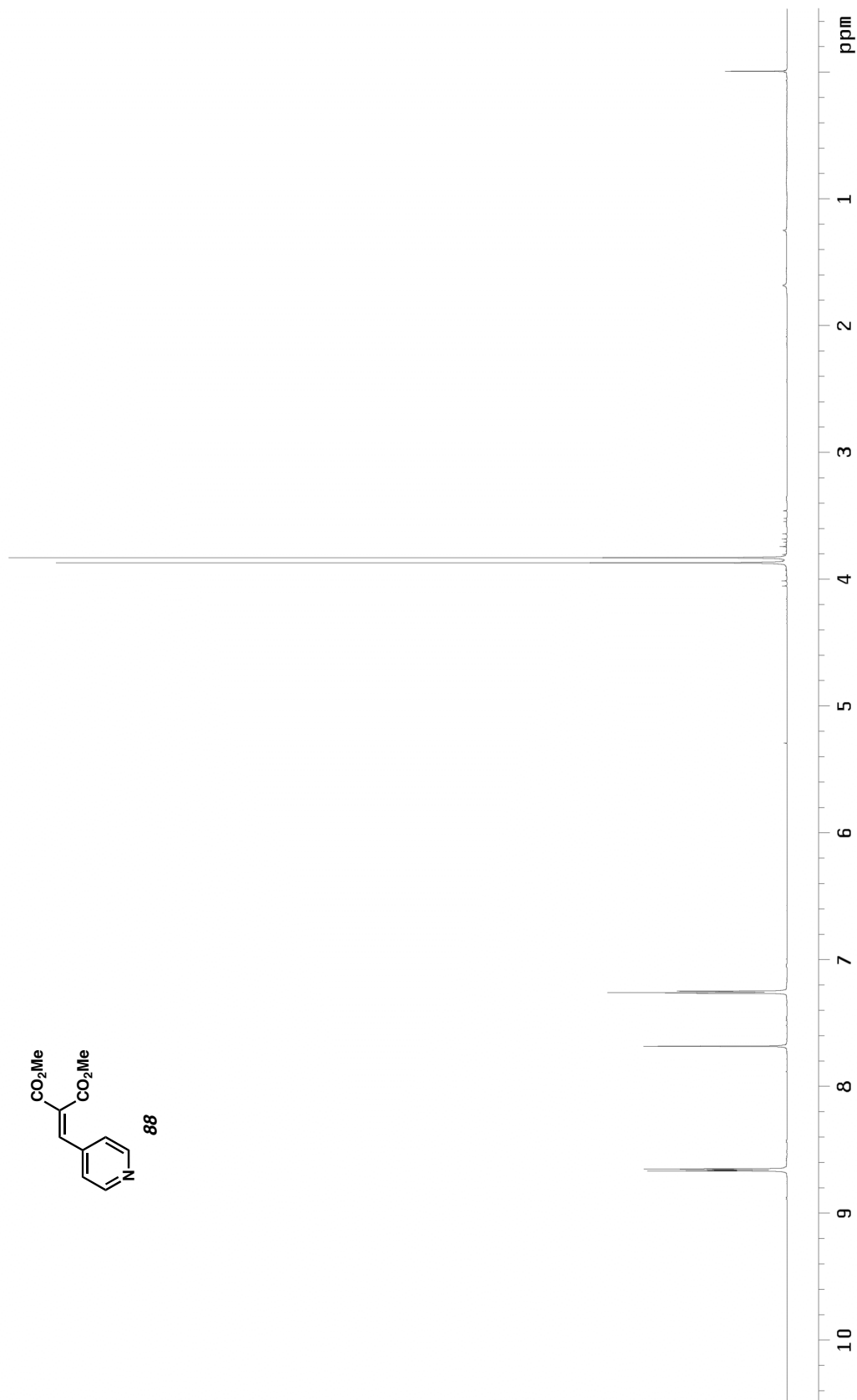


Figure A2.10 ¹H NMR (500 MHz, CDCl₃) of compound **88**

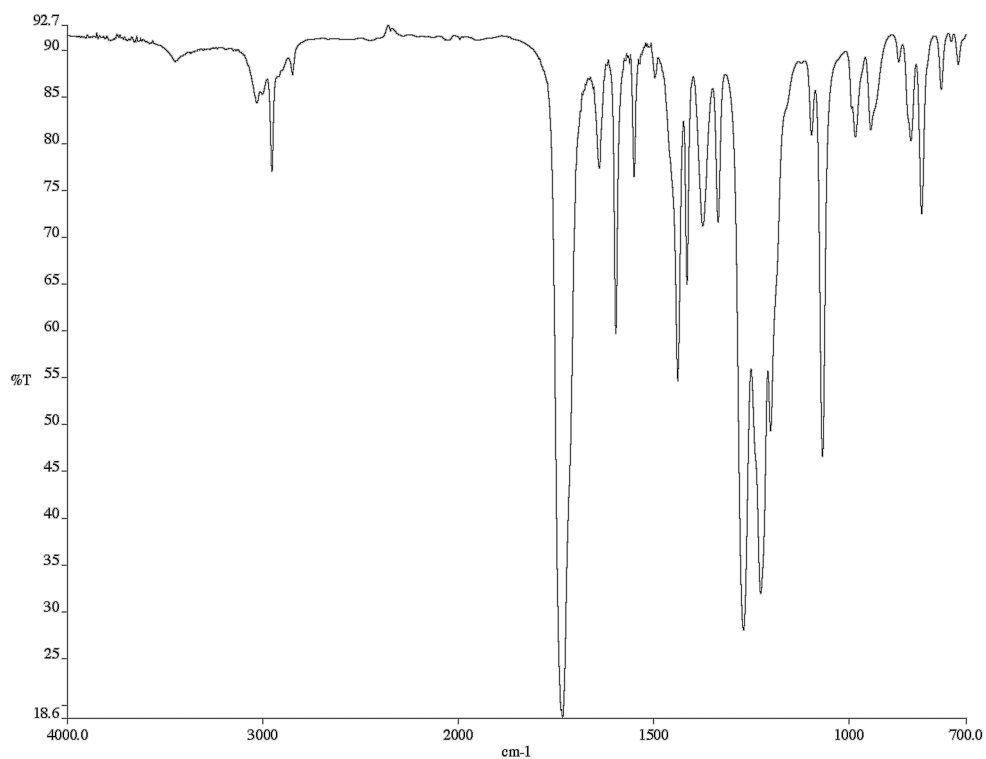


Figure A2.11 Infrared spectrum (thin film/NaCl) of compound **88**

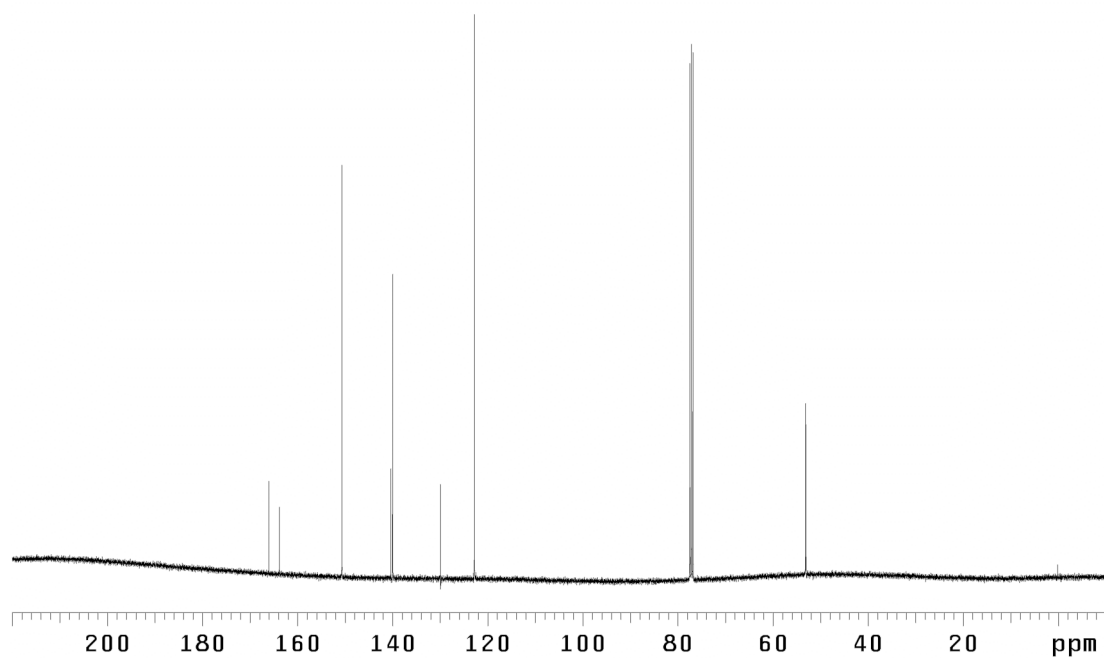


Figure A2.12 ¹³C NMR (126 MHz, CDCl₃) of compound **88**

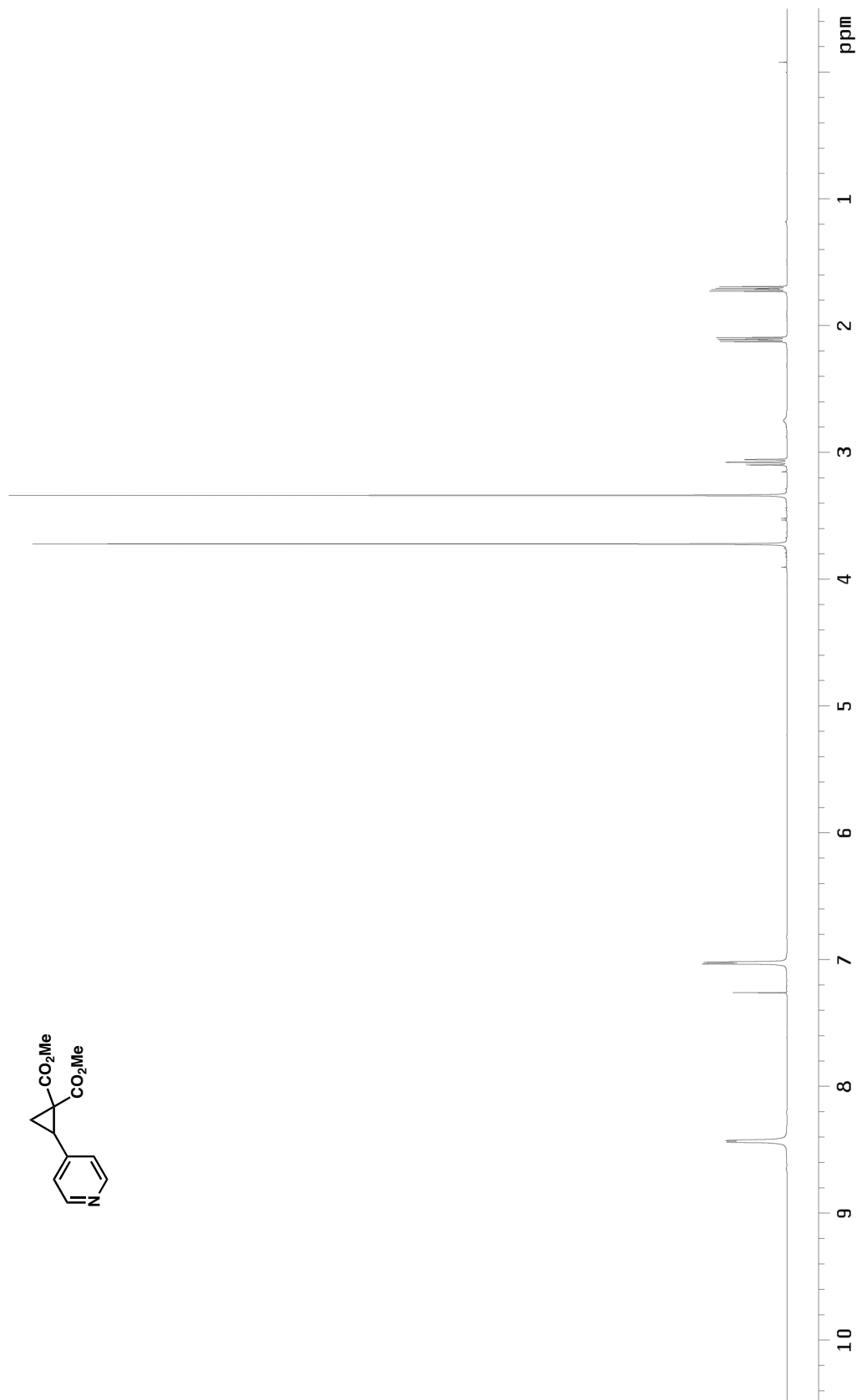


Figure A2.13 ^1H NMR (500 MHz, CDCl_3) of compound **69**

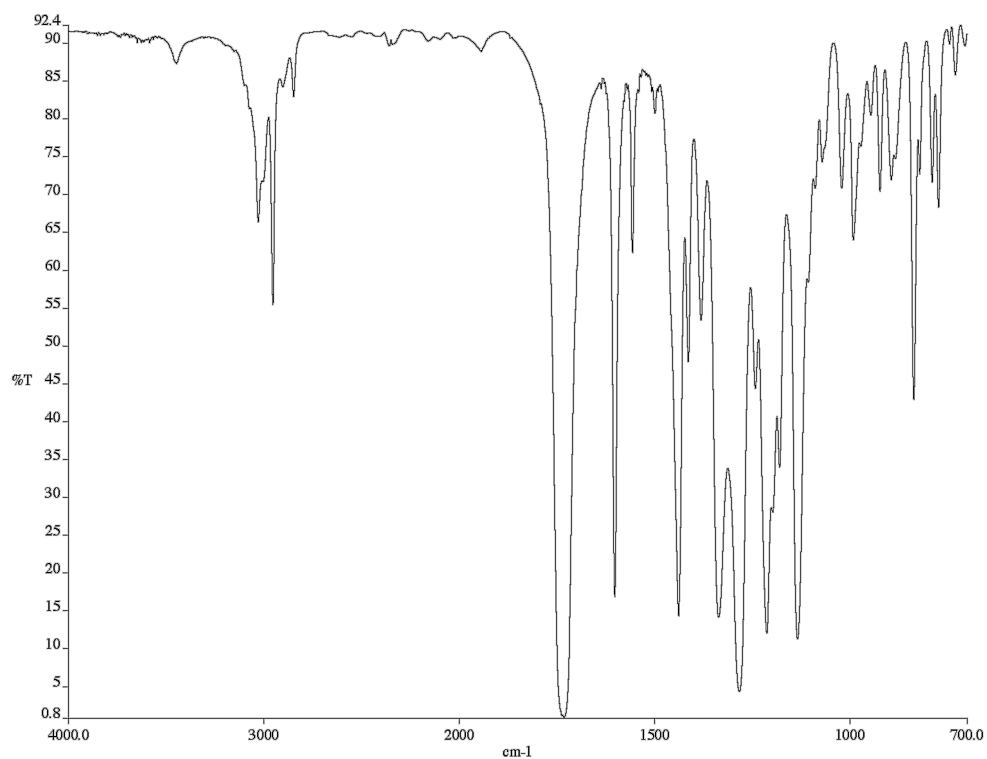


Figure A2.14 Infrared spectrum (thin film/NaCl) of compound **69**

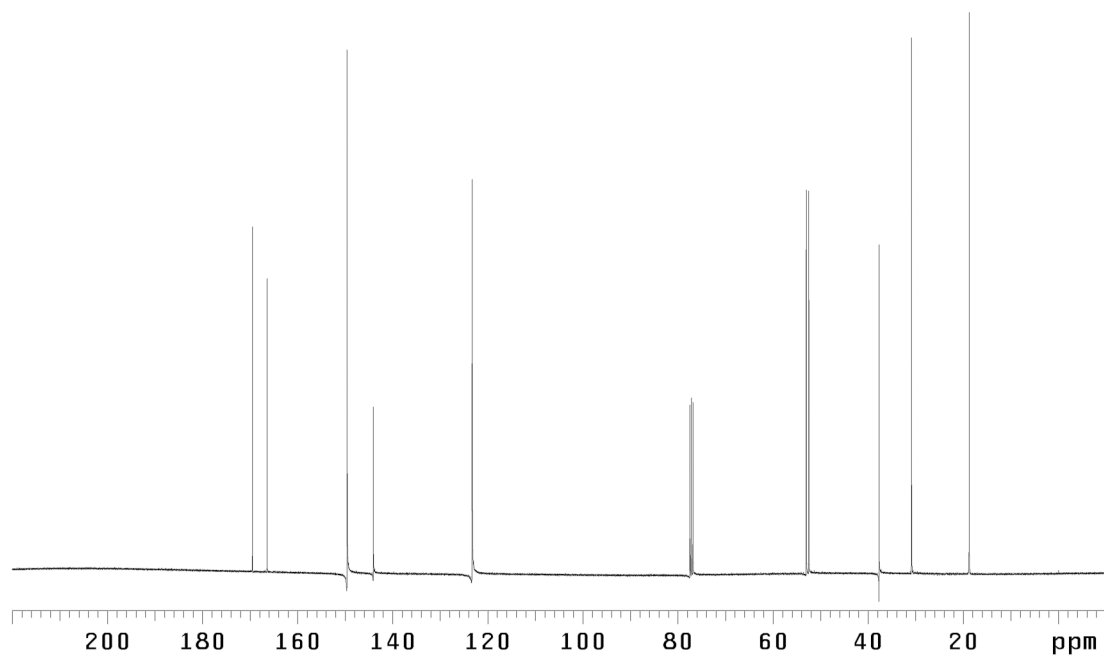


Figure A2.15 ^{13}C NMR (126 MHz, CDCl_3) of compound **69**

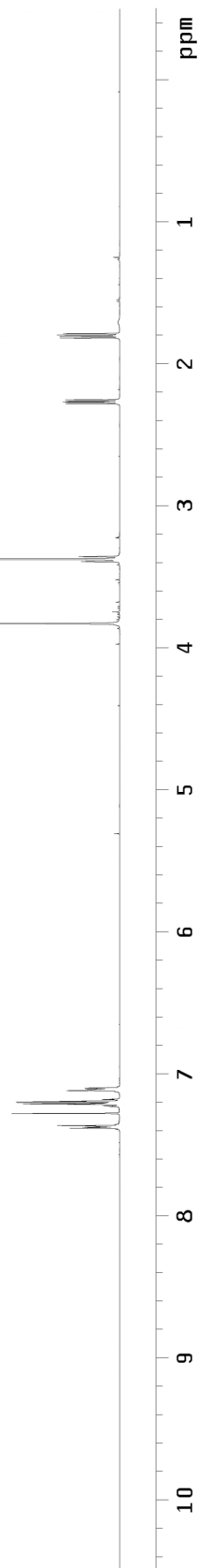
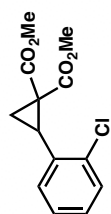


Figure A2.16 ^1H NMR (500 MHz, CDCl_3) of compound **92**

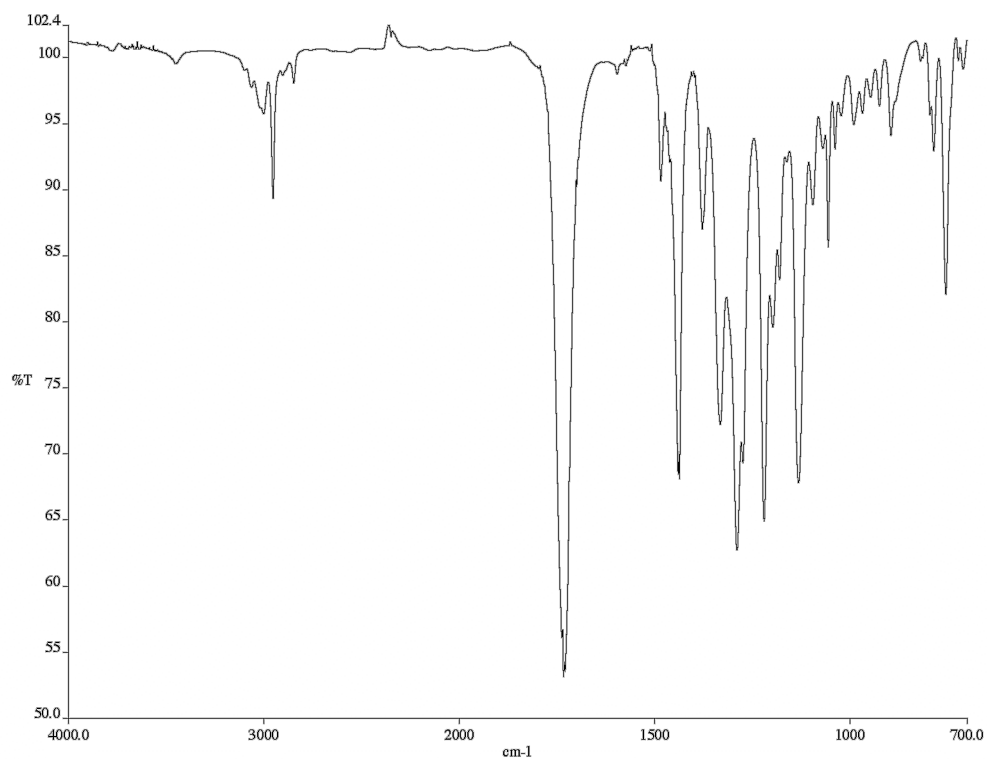


Figure A2.17 Infrared spectrum (thin film/NaCl) of compound **92**

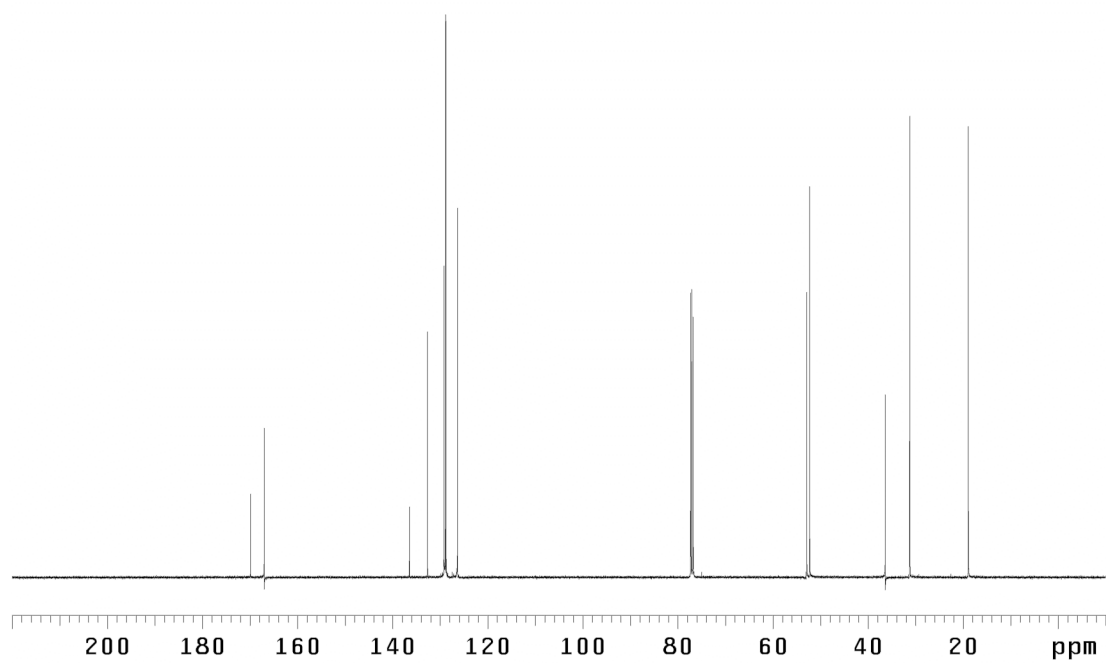


Figure A2.18 ¹³C NMR (126 MHz, CDCl₃) of compound **92**

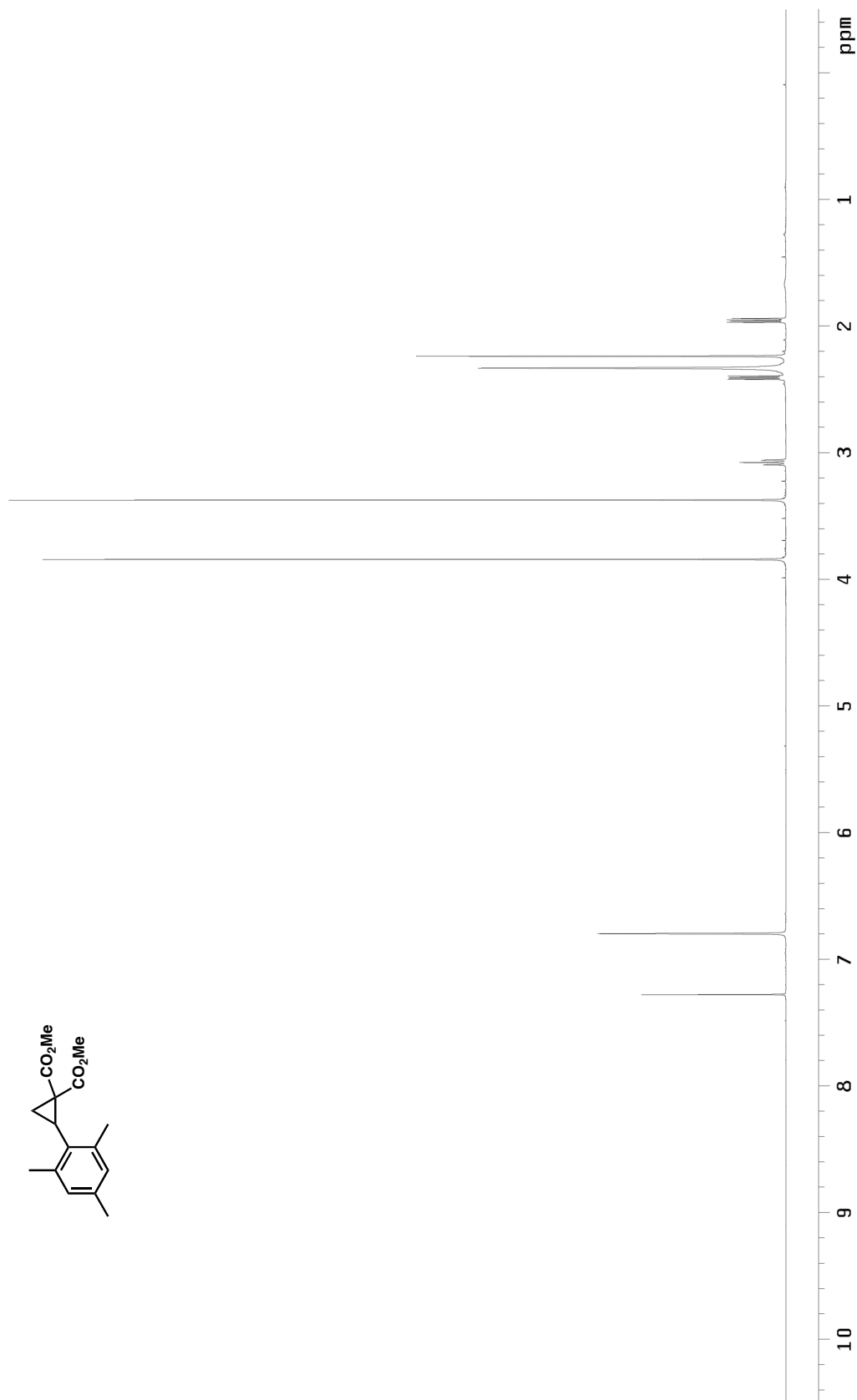


Figure A2.19. ¹H NMR (500 MHz, CDCl₃) of compound **93**

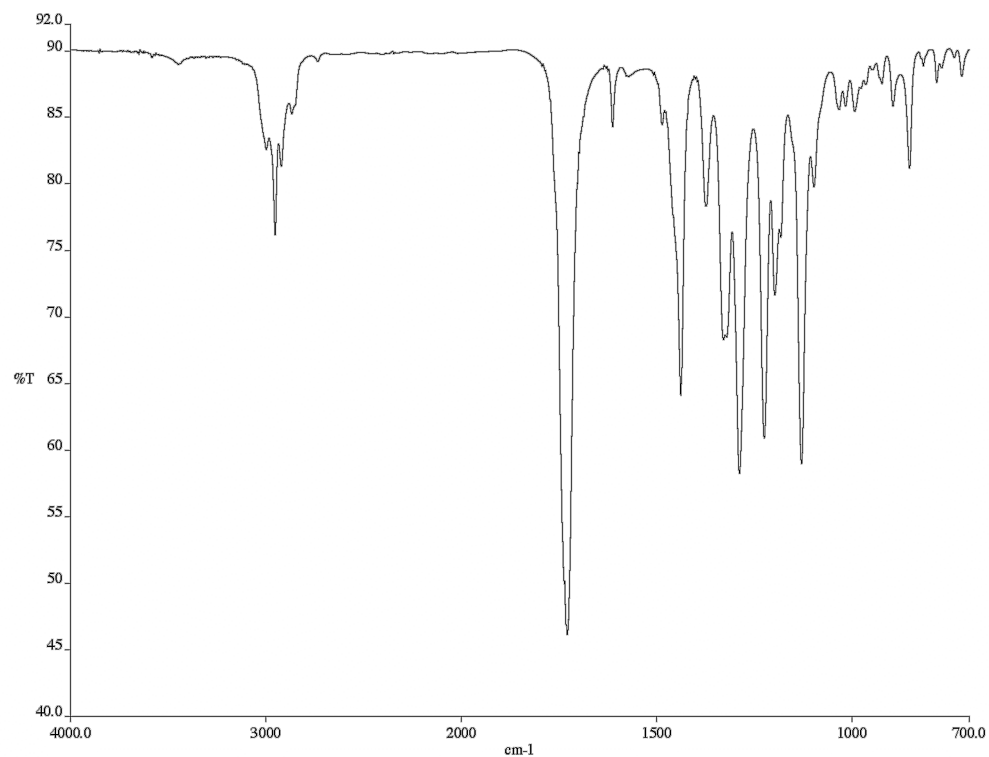


Figure A2.20 Infrared spectrum (thin film/NaCl) of compound **93**

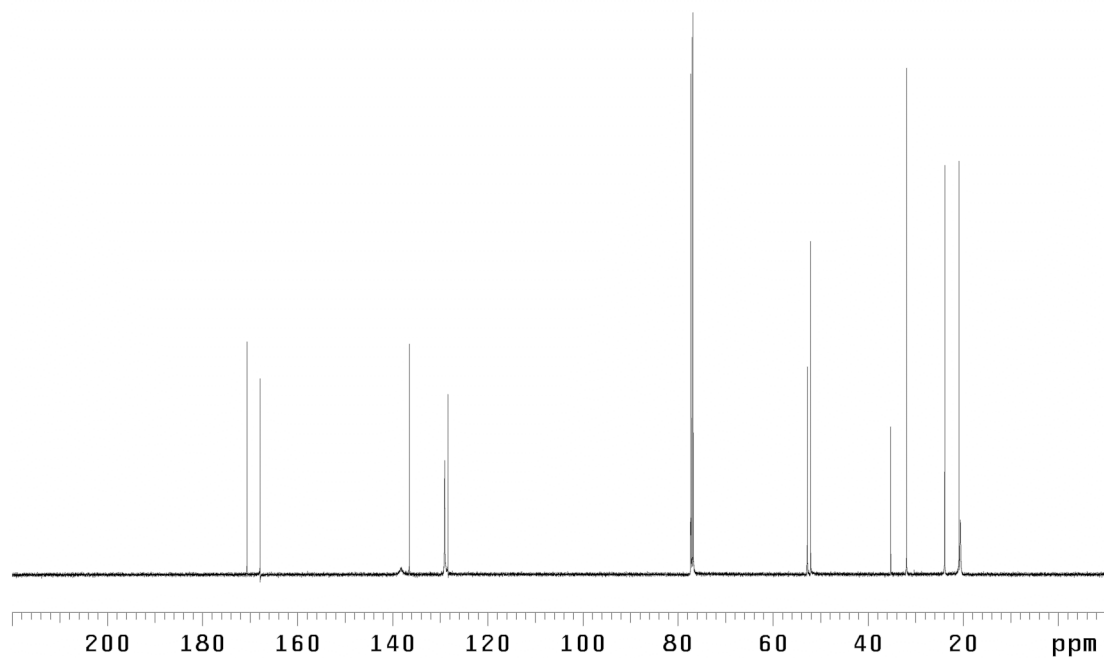


Figure A2.21 ¹³C NMR (126 MHz, CDCl₃) of compound **93**

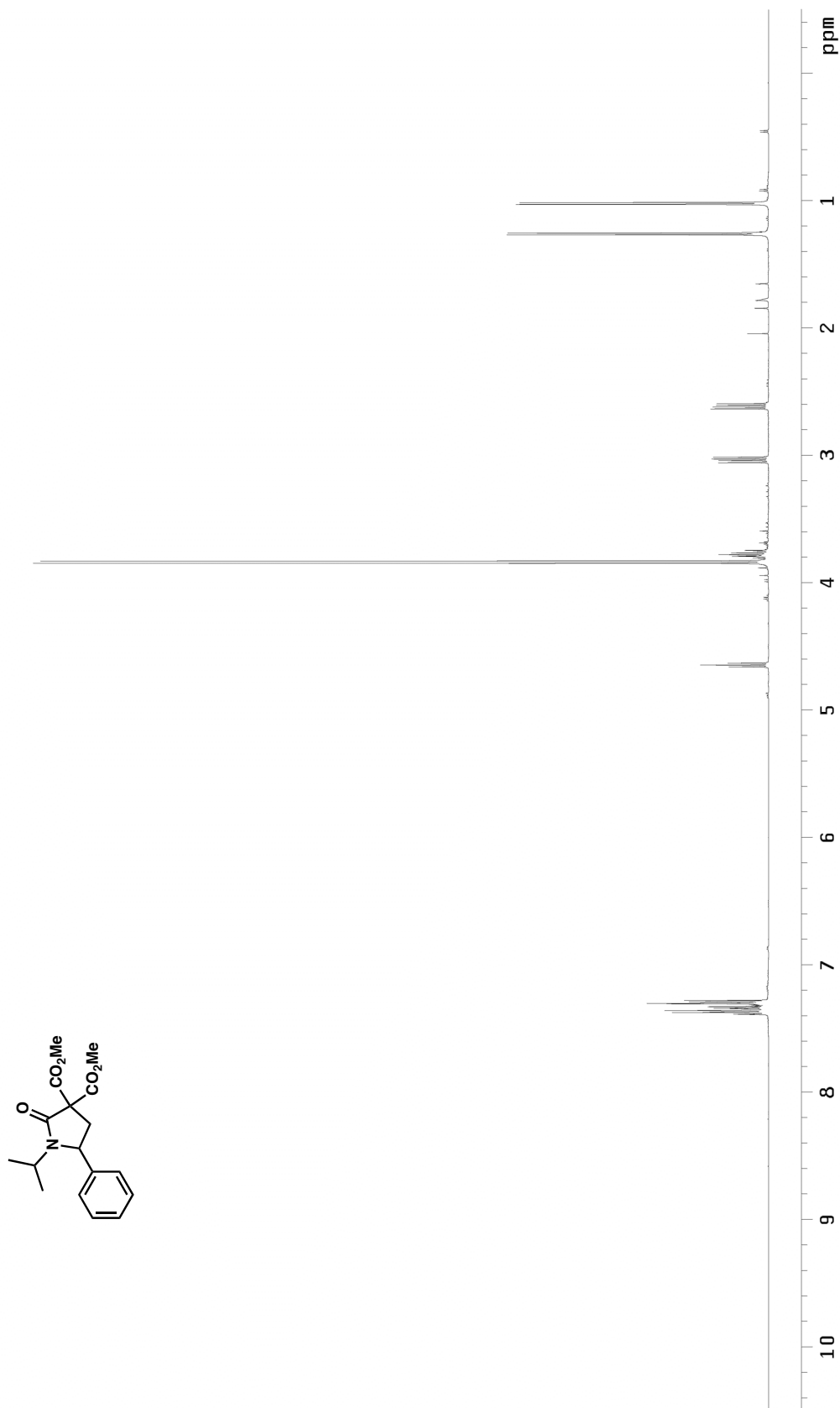


Figure A2.22 ¹H NMR (500 MHz, CDCl₃) of compound **34**

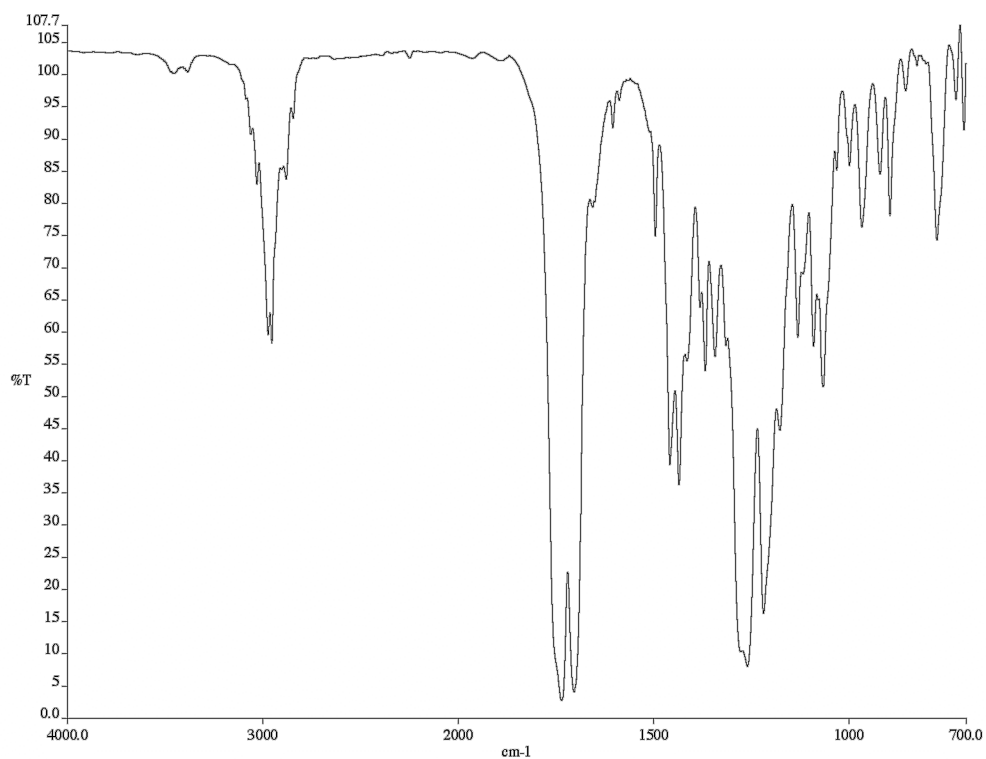


Figure A2.23 Infrared spectrum (thin film/NaCl) of compound **34**

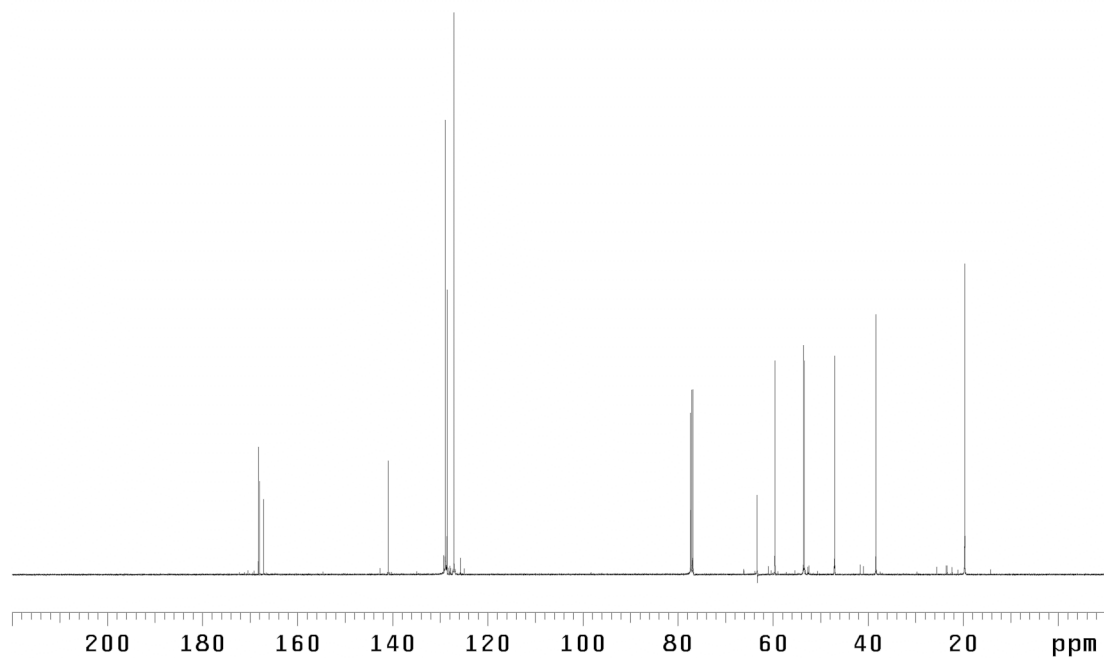


Figure A2.24 ^{13}C NMR (126 MHz, CDCl_3) of compound **34**

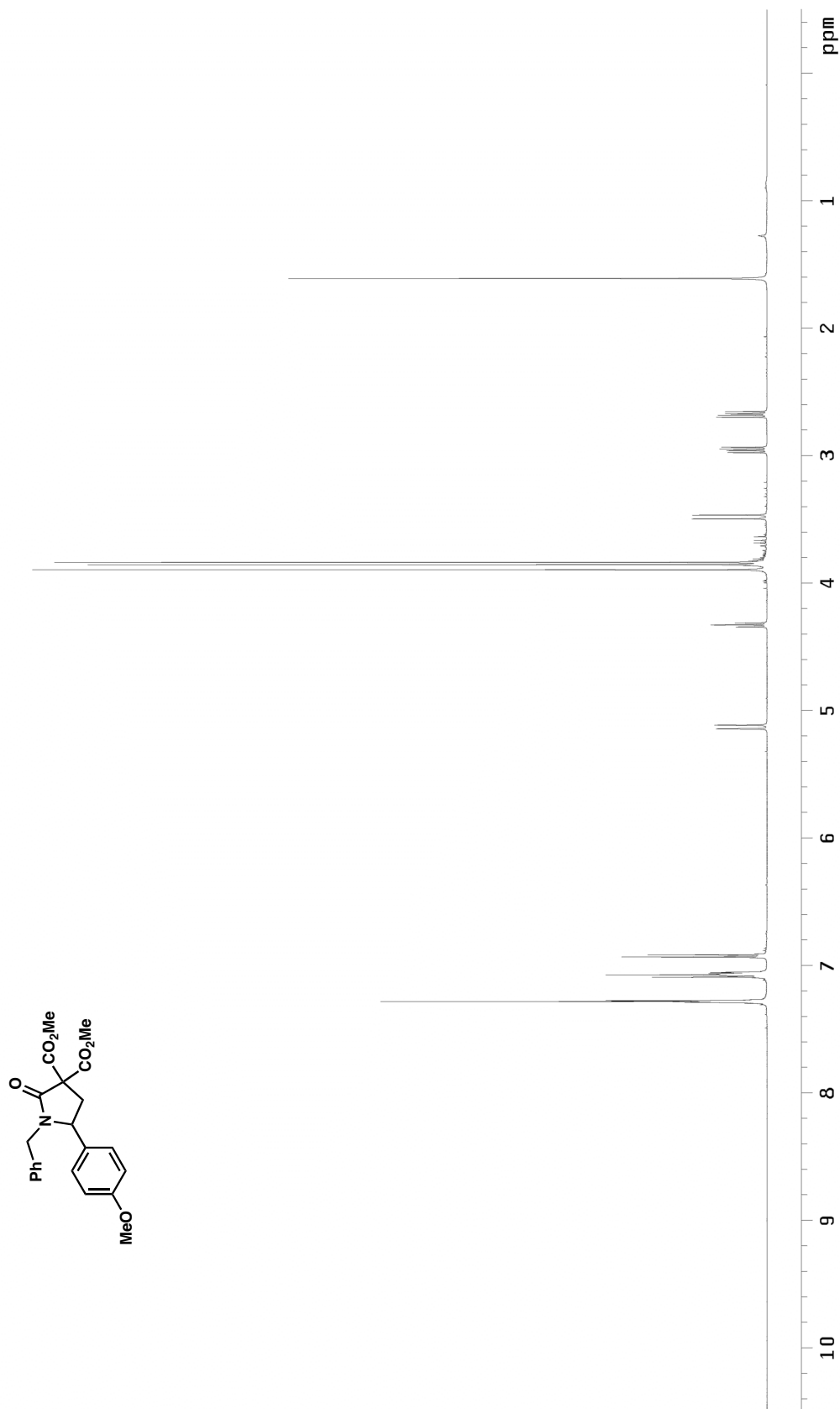


Figure A2.25 ¹H NMR (500 MHz, CDCl₃) of compound **35**

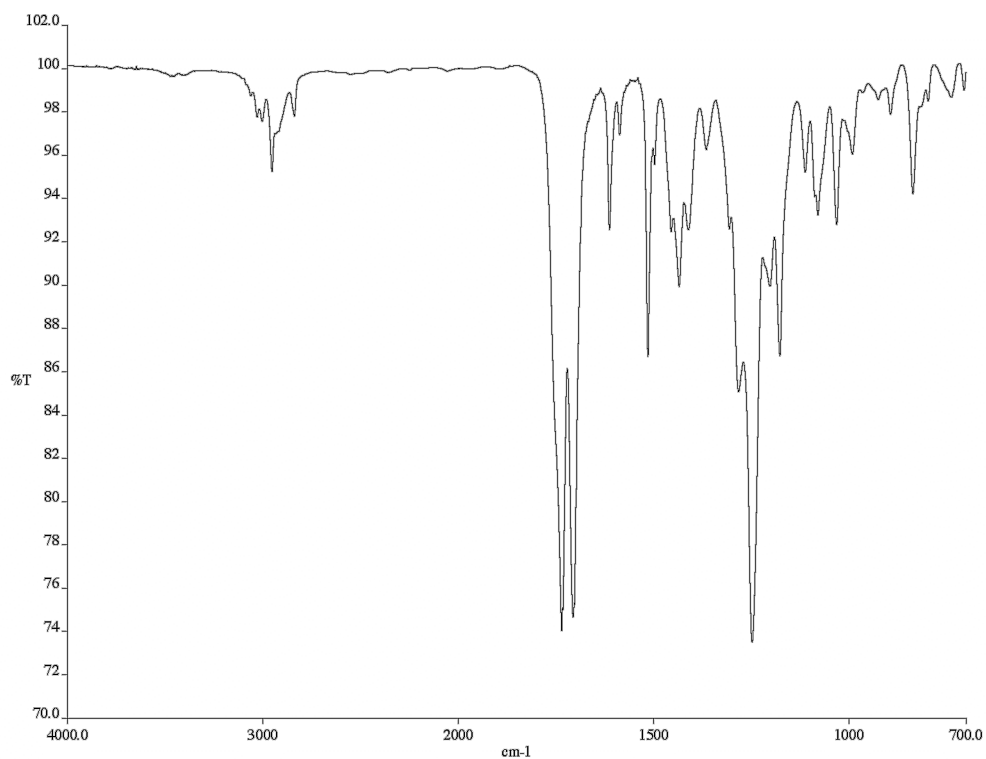


Figure A2.26 Infrared spectrum (thin film/NaCl) of compound **35**

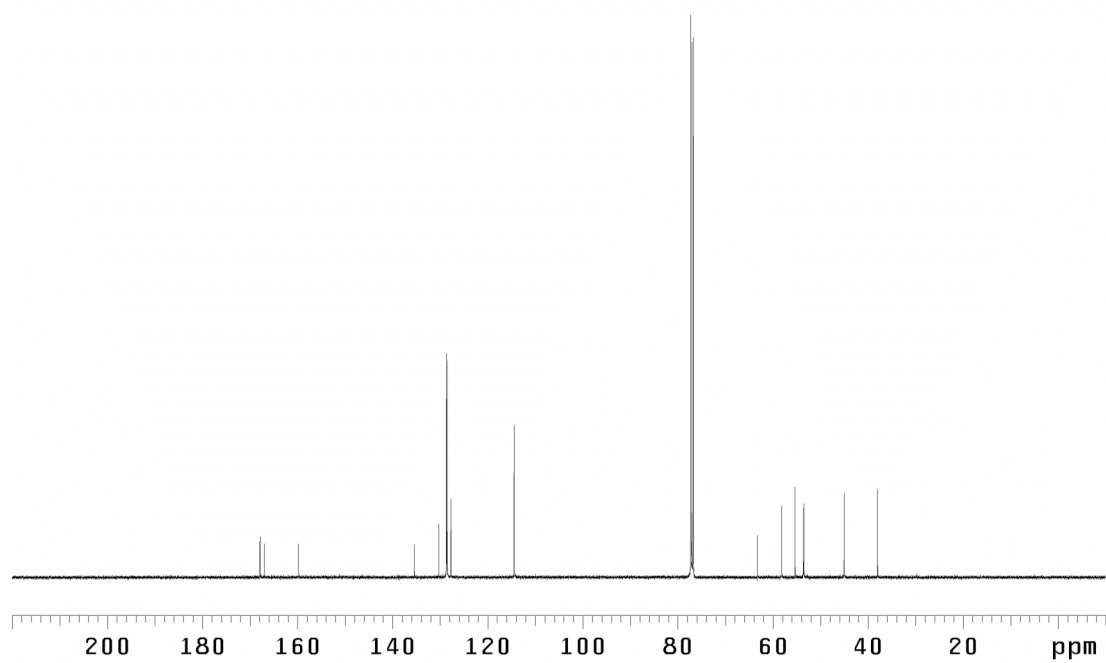


Figure A2.27 ¹³C NMR (126 MHz, CDCl₃) of compound **35**

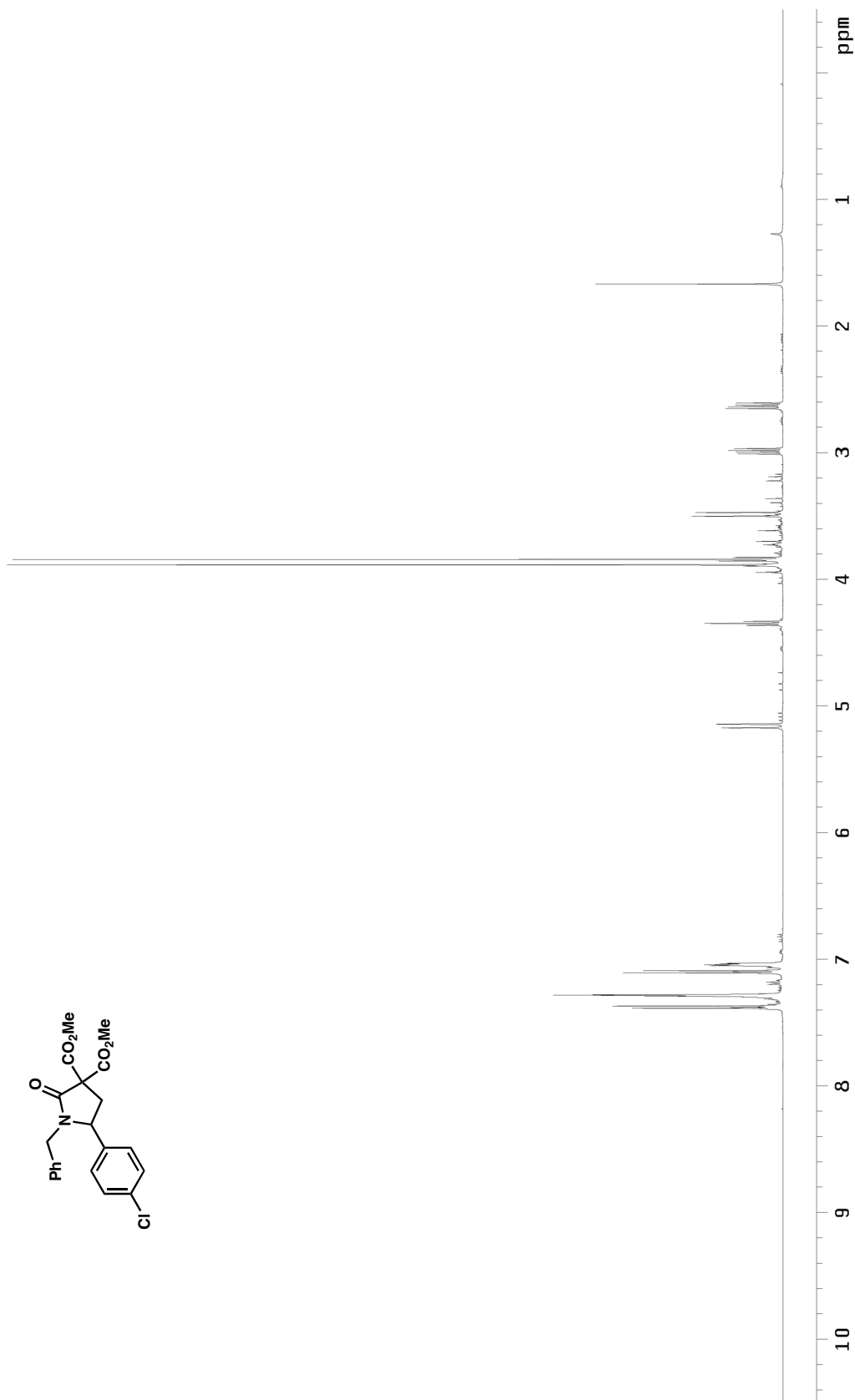


Figure A2.28 ¹H NMR (500 MHz, CDCl₃) of compound **36**

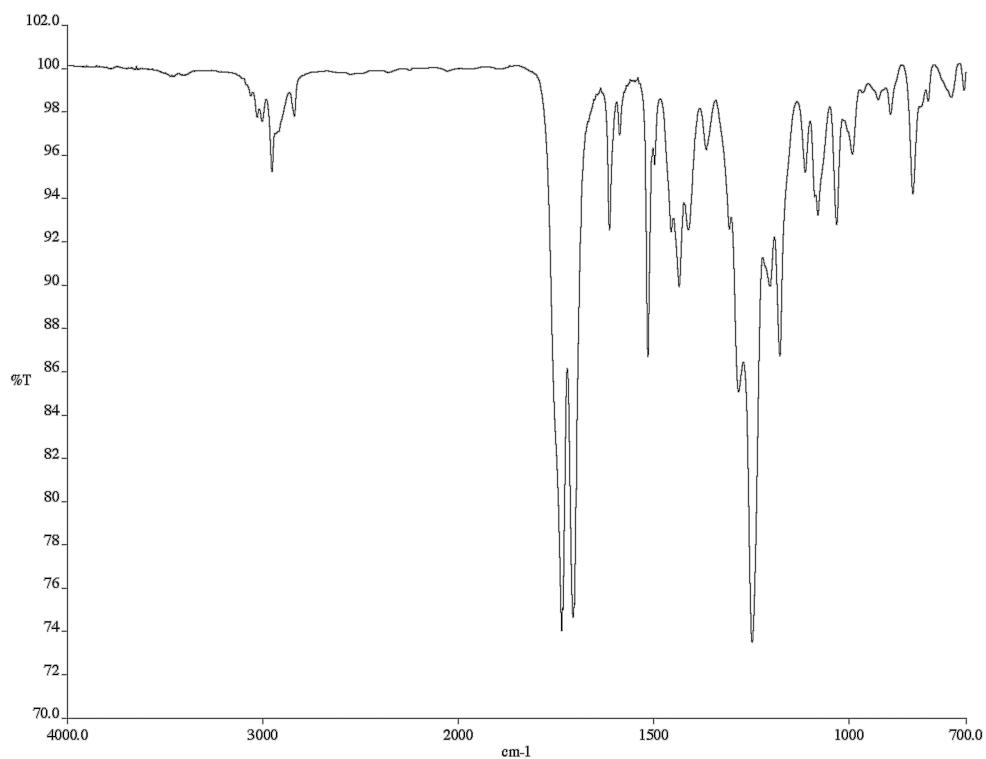


Figure A2.29 Infrared spectrum (thin film/NaCl) of compound **36**

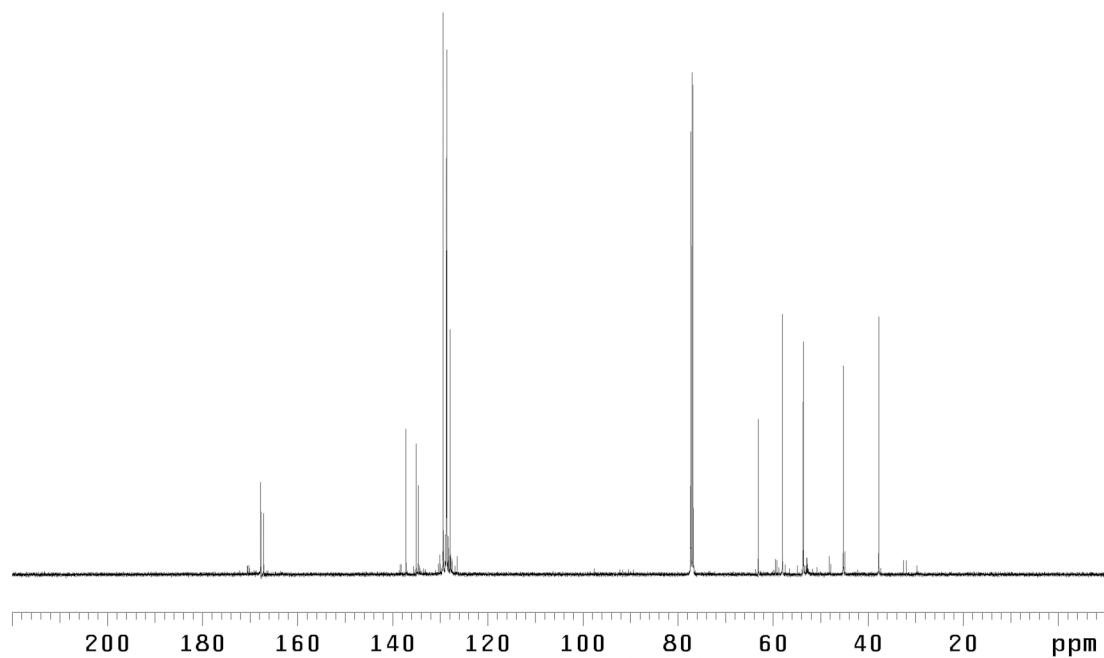


Figure A2.30 ¹³C NMR (126 MHz, CDCl₃) of compound **36**

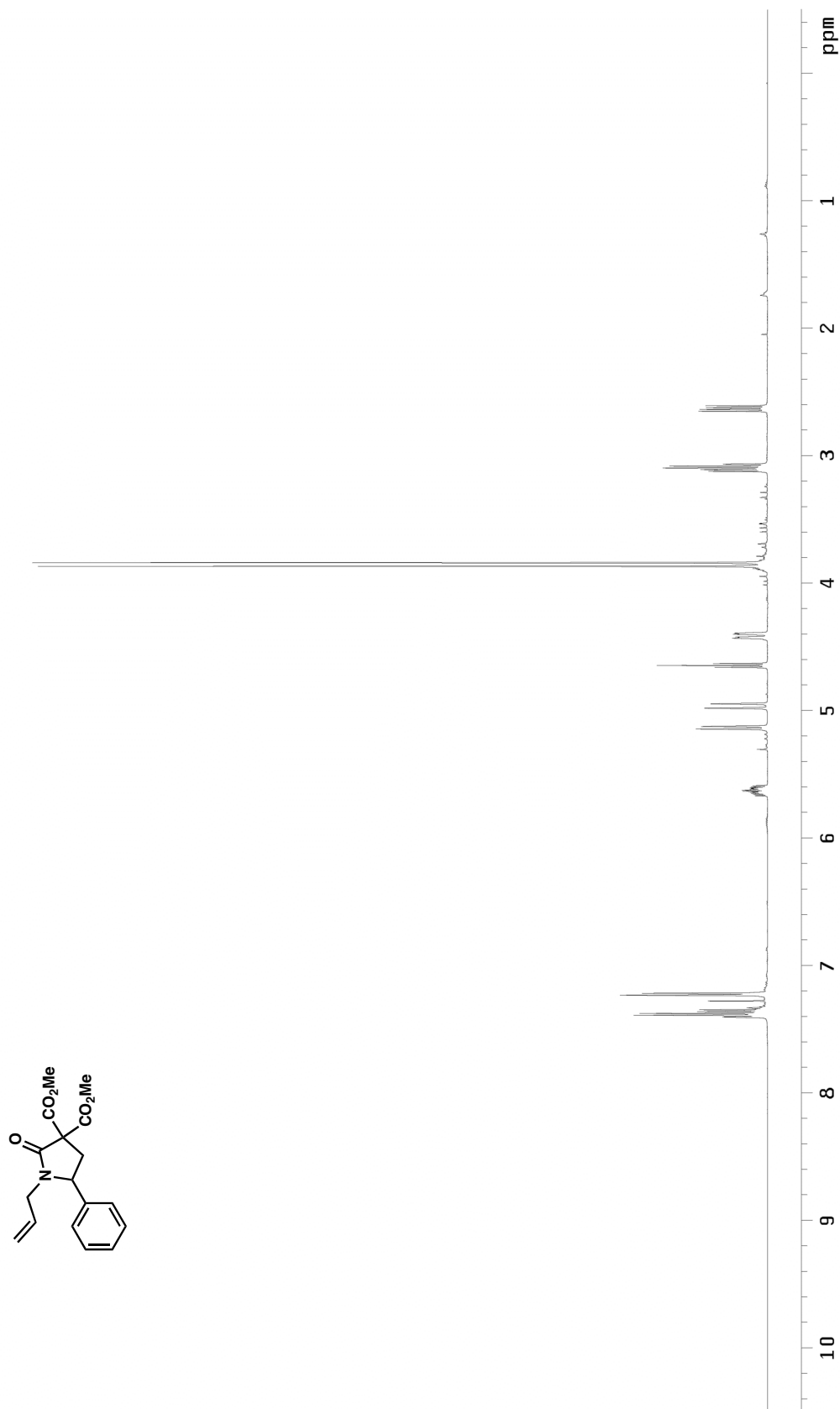


Figure A2.31 ¹H NMR (500 MHz, CDCl₃) of compound **37**

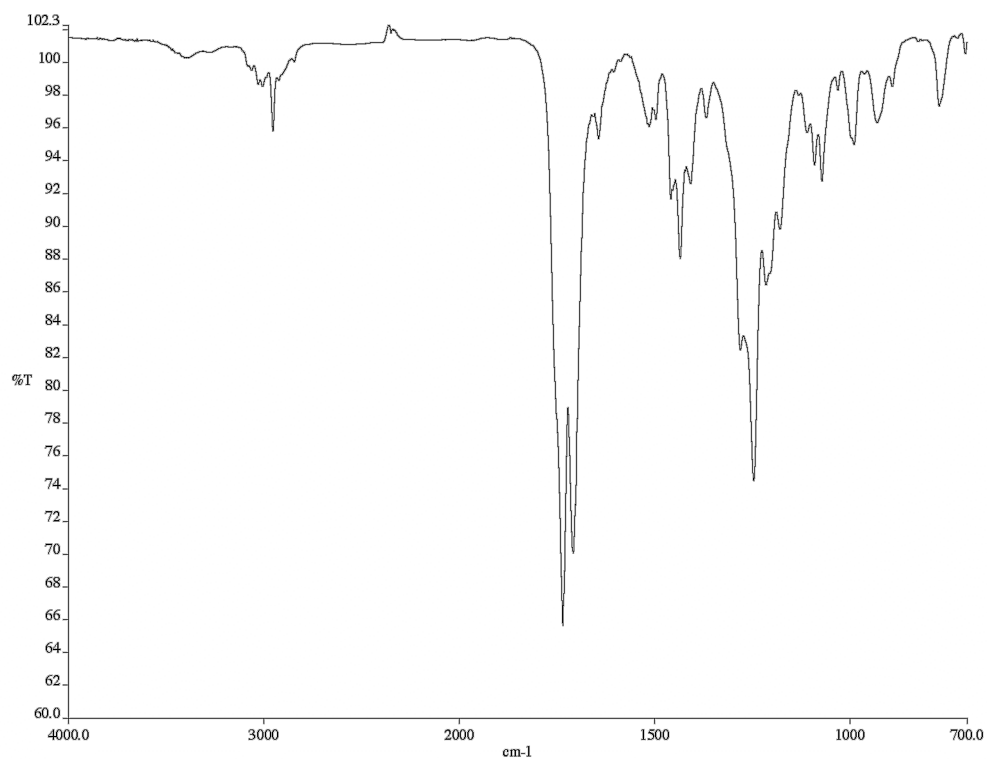


Figure A2.32 Infrared spectrum (thin film/NaCl) of compound **37**

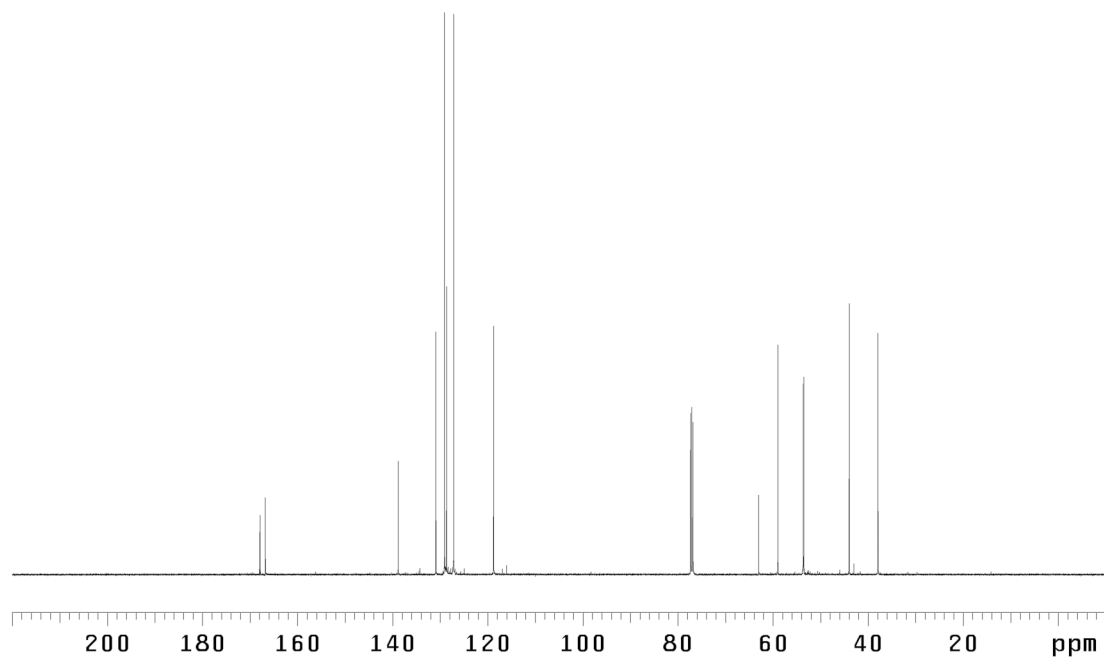


Figure A2.33 ¹³C NMR (126 MHz, CDCl₃) of compound **37**

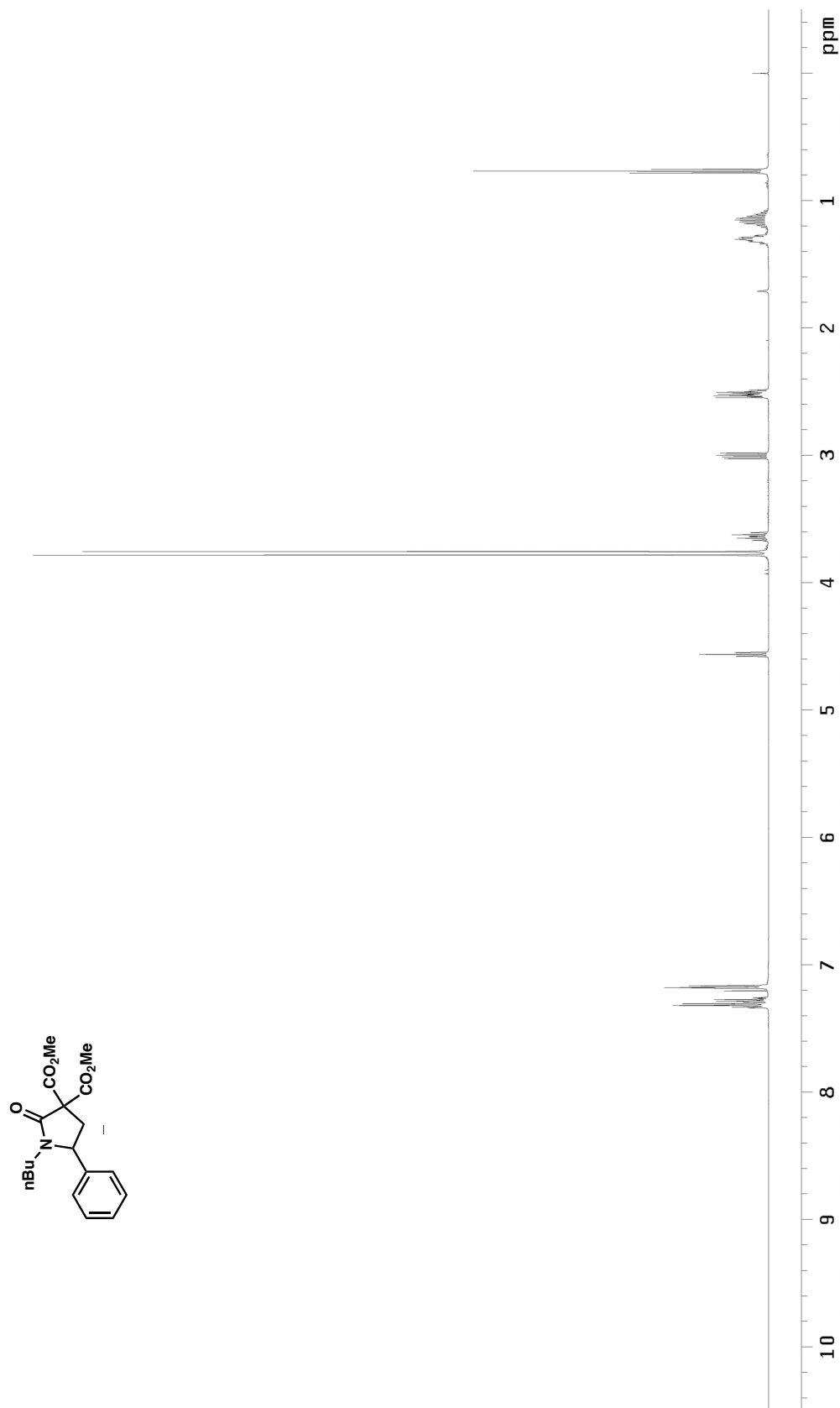


Figure A2.34 ^1H NMR (500 MHz, CDCl_3) of compound **38**

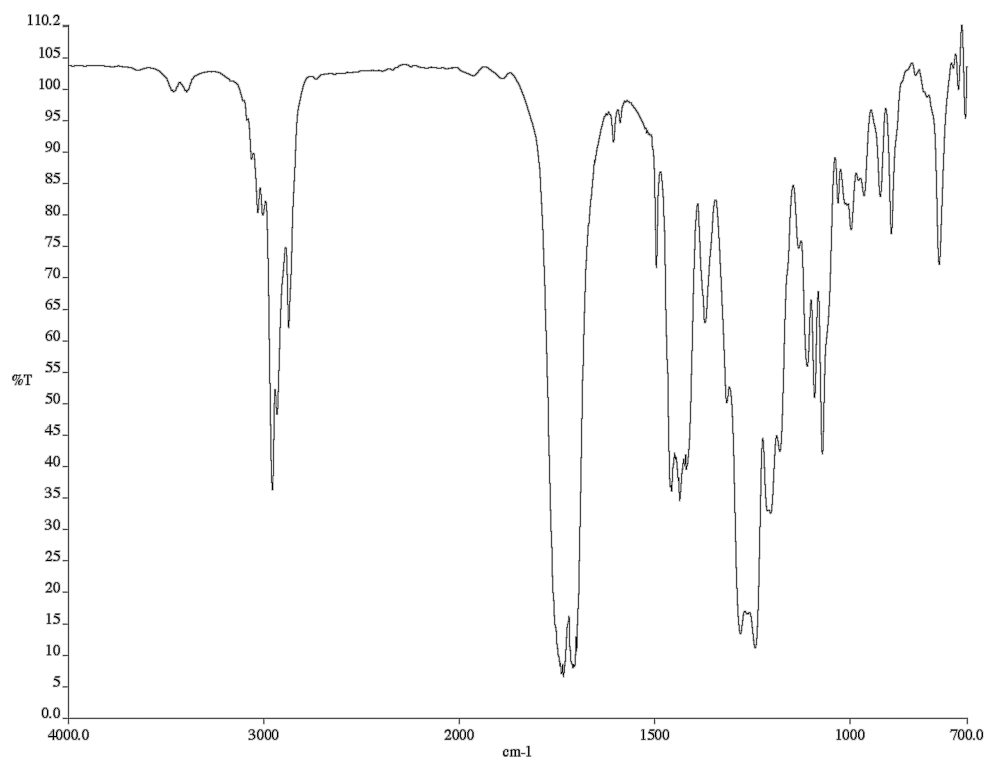


Figure A2.35 Infrared spectrum (thin film/NaCl) of compound **38**

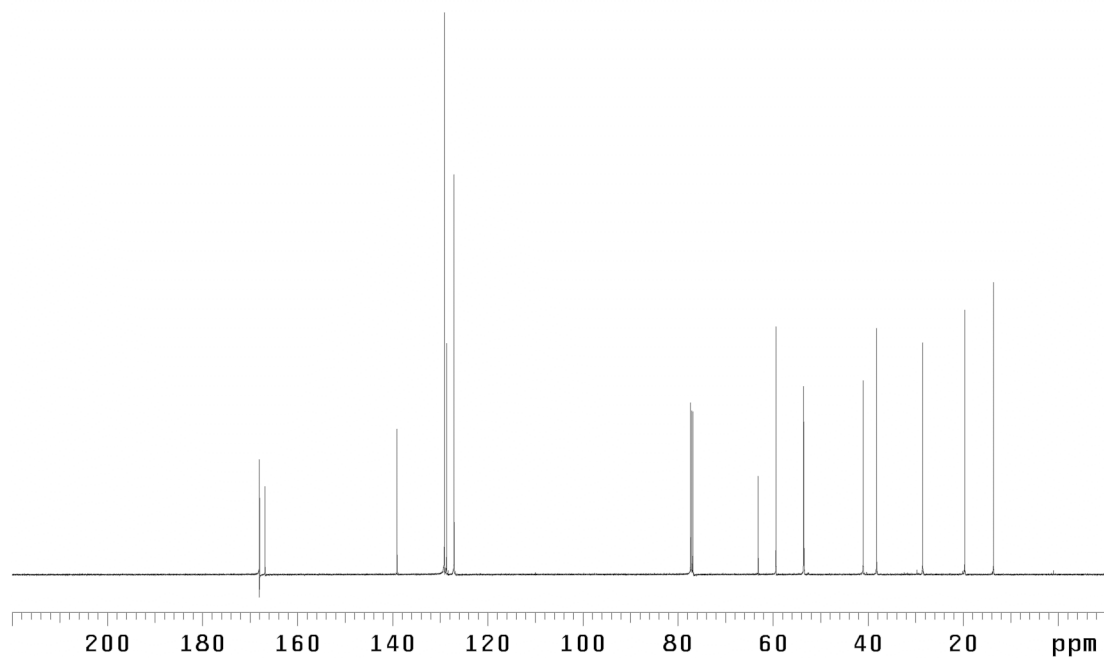


Figure A2.36 ¹³C NMR (126 MHz, CDCl₃) of compound **38**

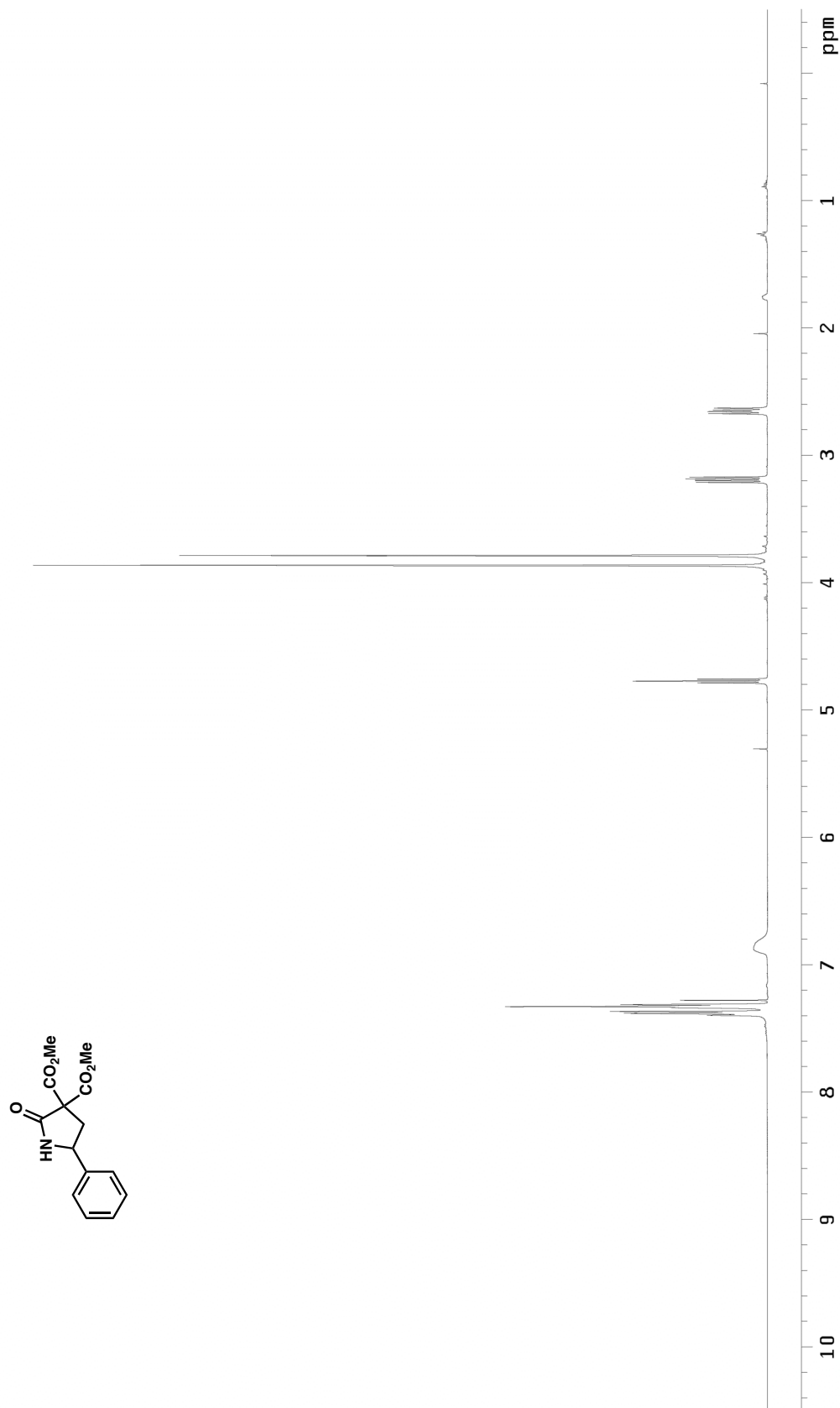


Figure A2.37 ¹H NMR (500 MHz, CDCl₃) of compound **39**

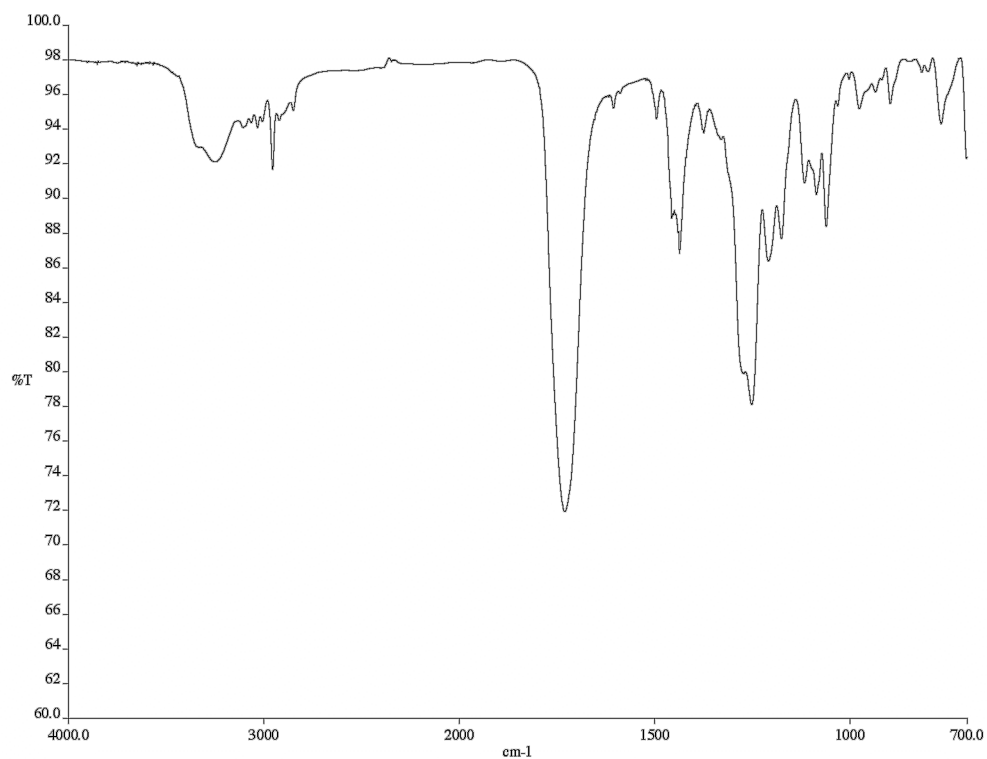


Figure A2.38 Infrared spectrum (thin film/NaCl) of compound **39**

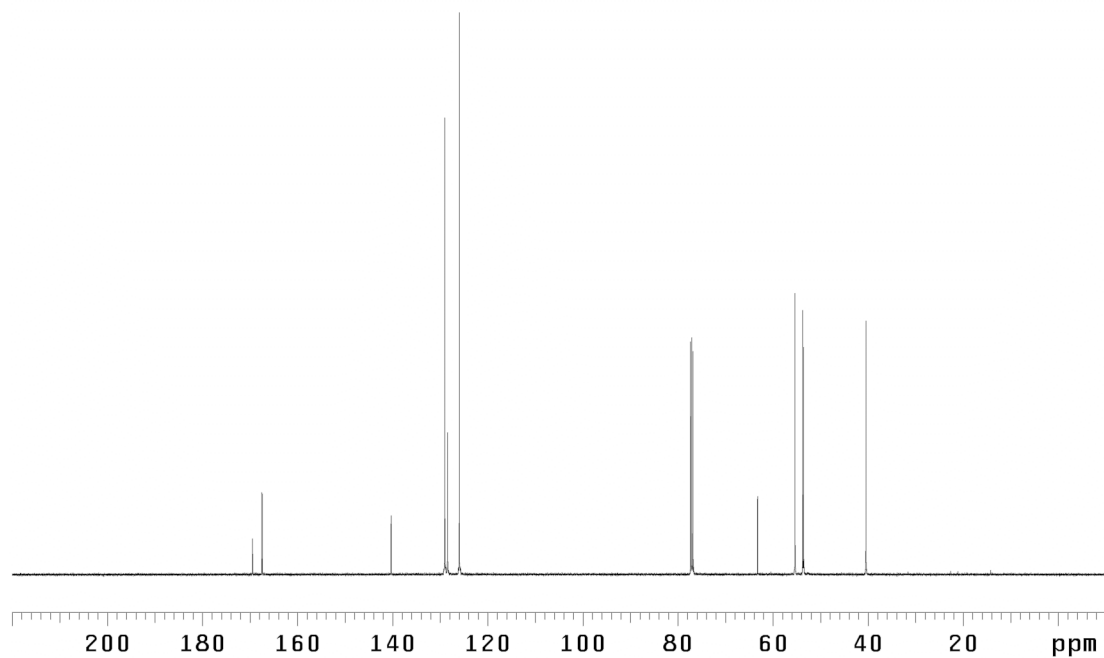


Figure A2.39 ¹³C NMR (126 MHz, CDCl₃) of compound **39**

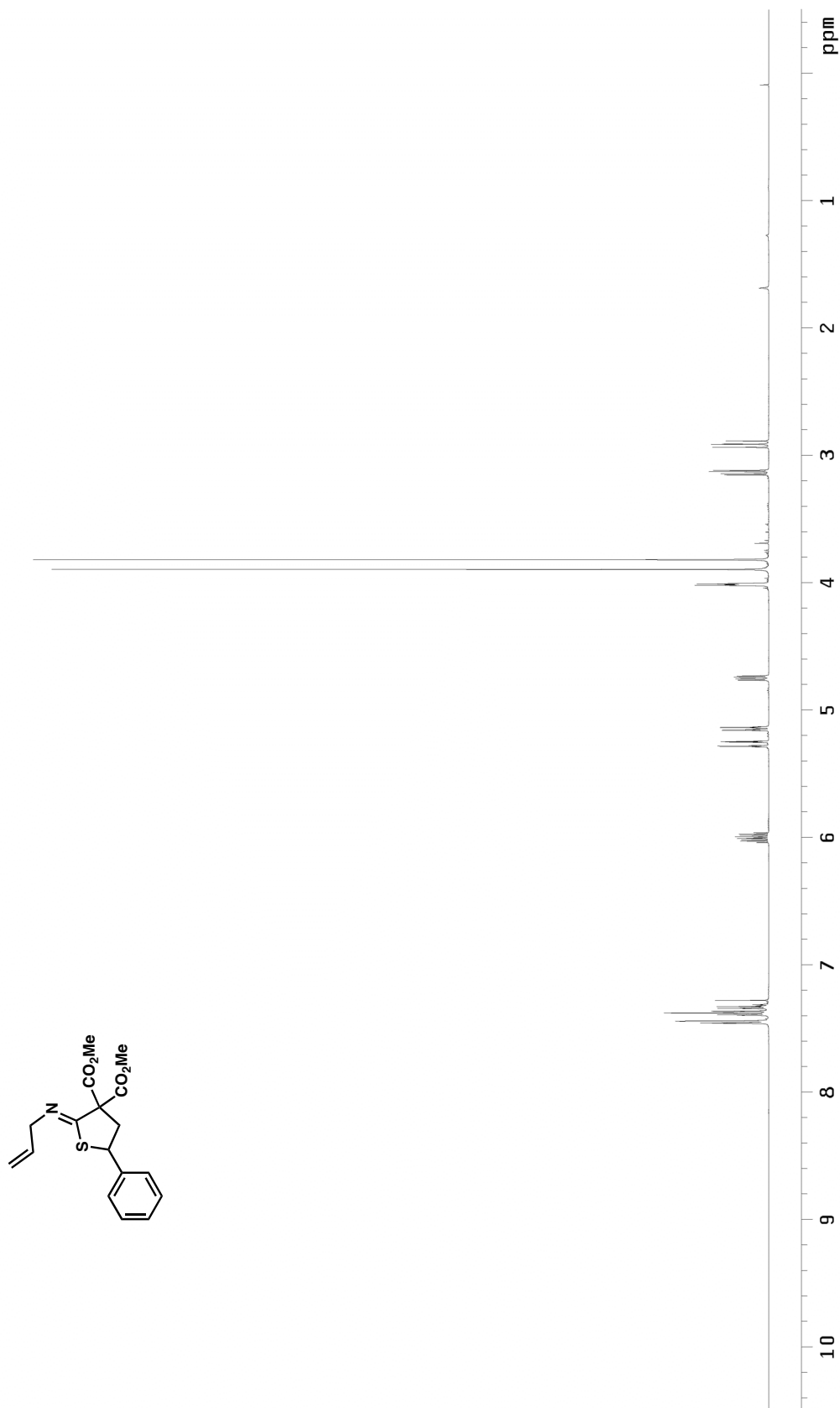


Figure A2.40 ¹H NMR (500 MHz, CDCl₃) of compound **45**

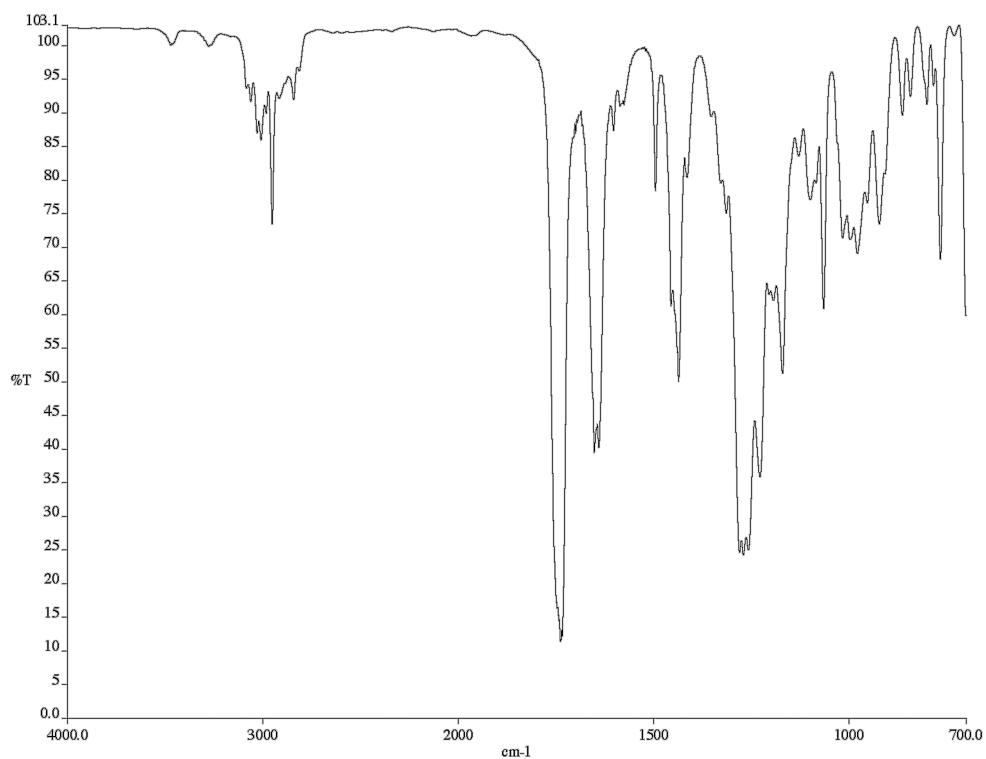


Figure A2.41 Infrared spectrum (thin film/NaCl) of compound **45**

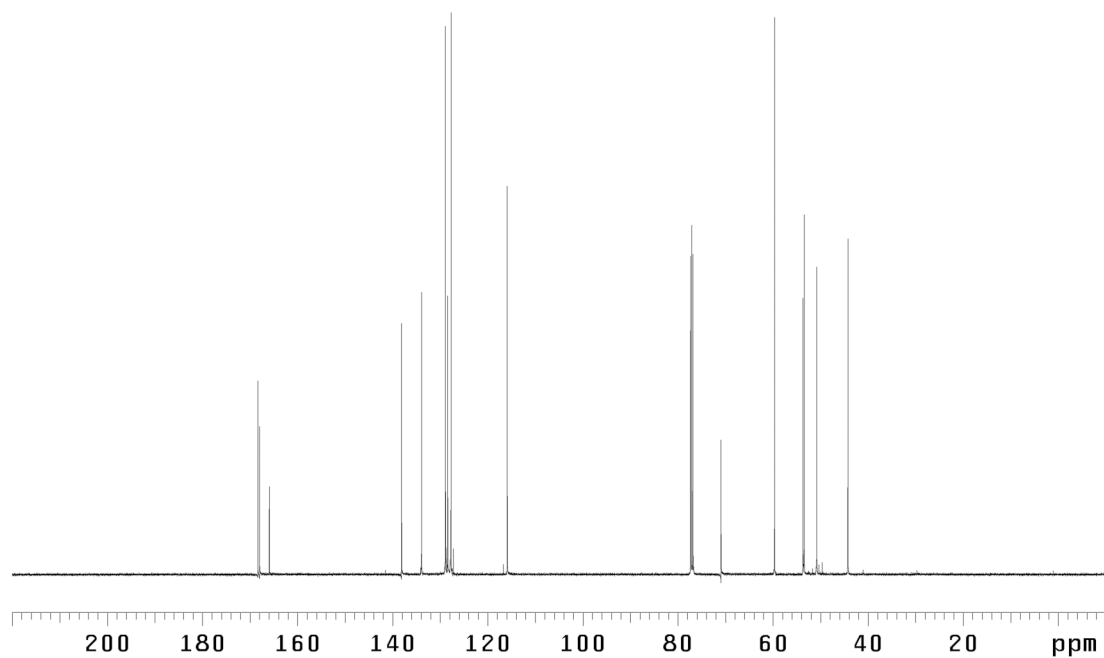


Figure A2.42 ¹³C NMR (126 MHz, CDCl₃) of compound **45**

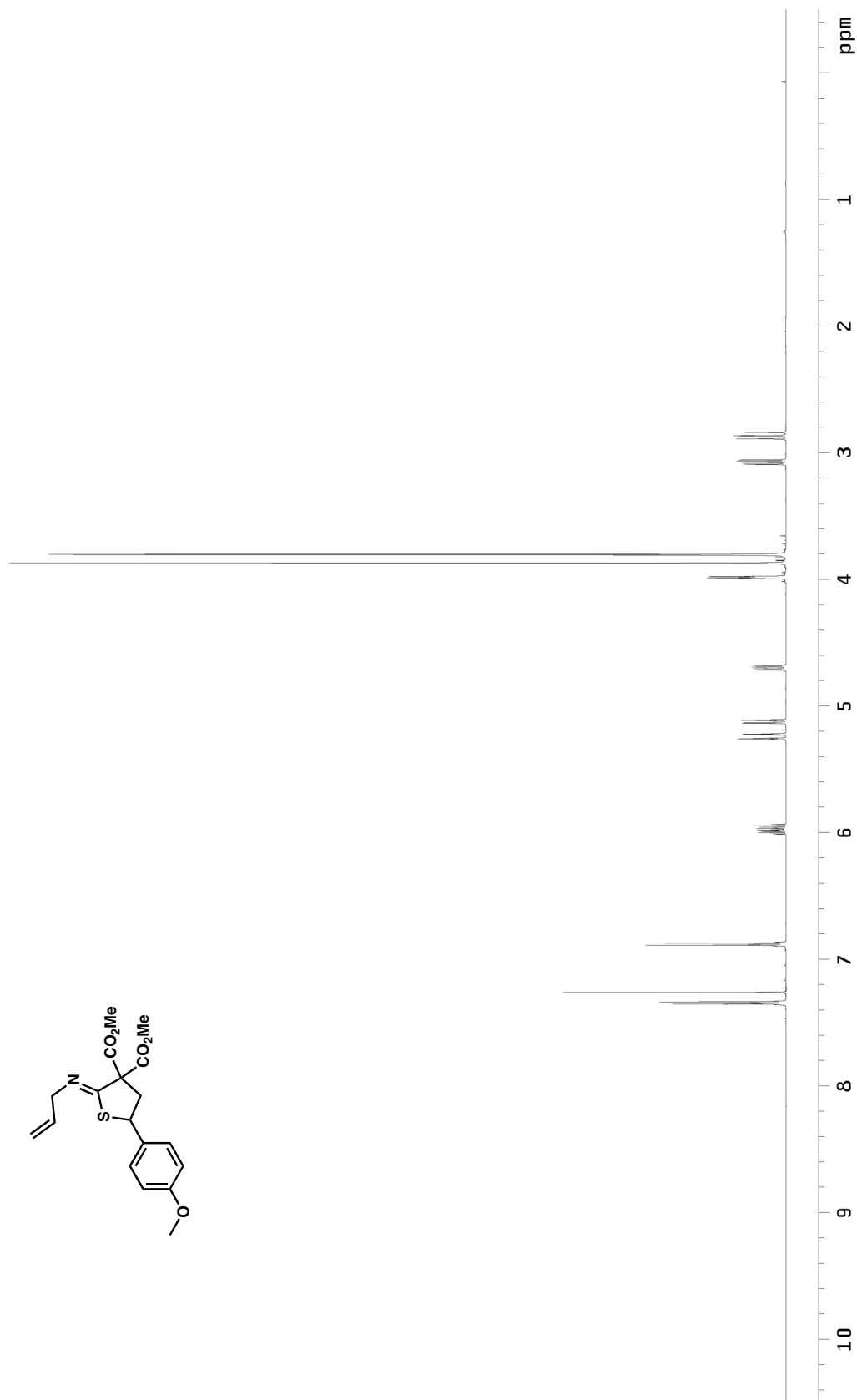


Figure A2.43 ¹H NMR (500 MHz, CDCl₃) of compound **40**

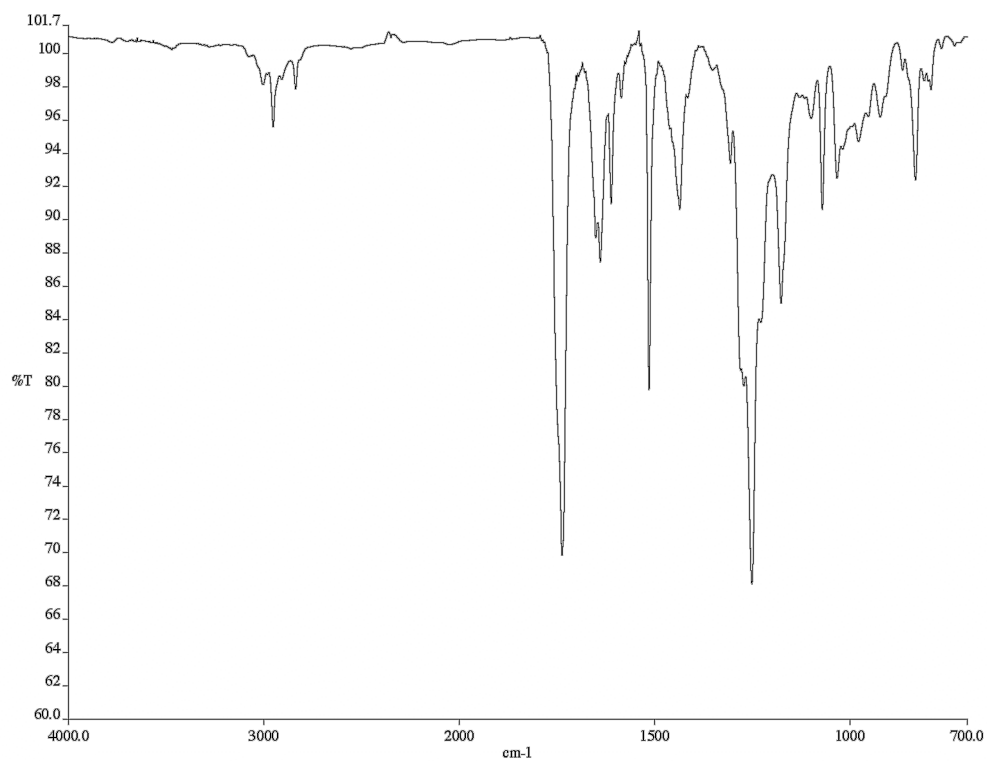


Figure A2.44 Infrared spectrum (thin film/NaCl) of compound **40**

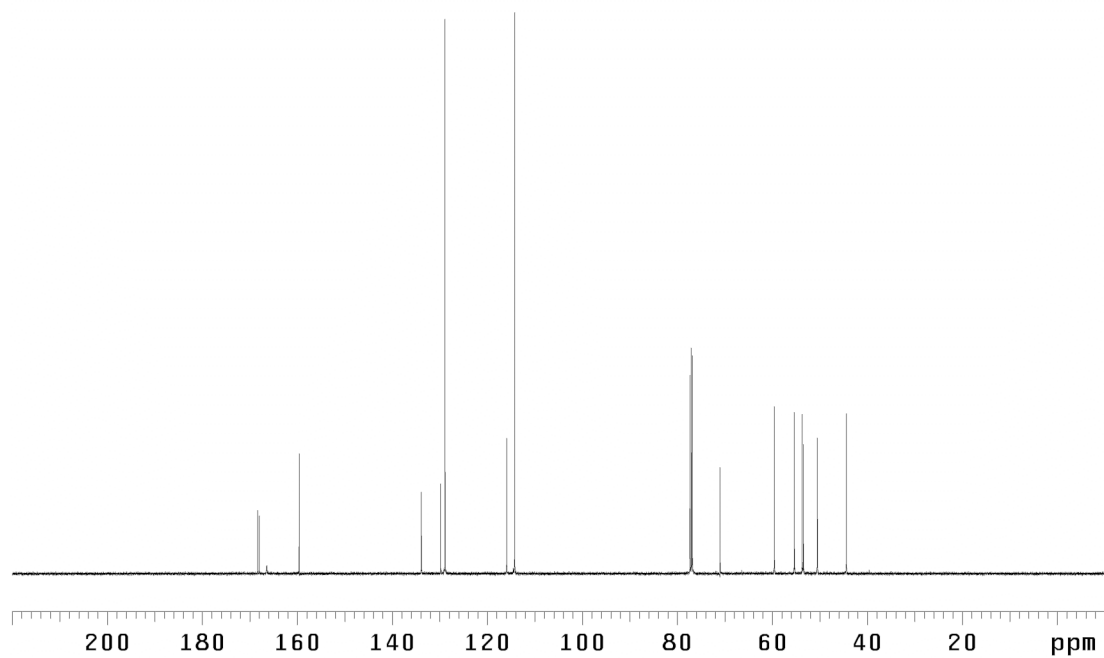


Figure A2.45 ¹³C NMR (126 MHz, CDCl₃) of compound **40**

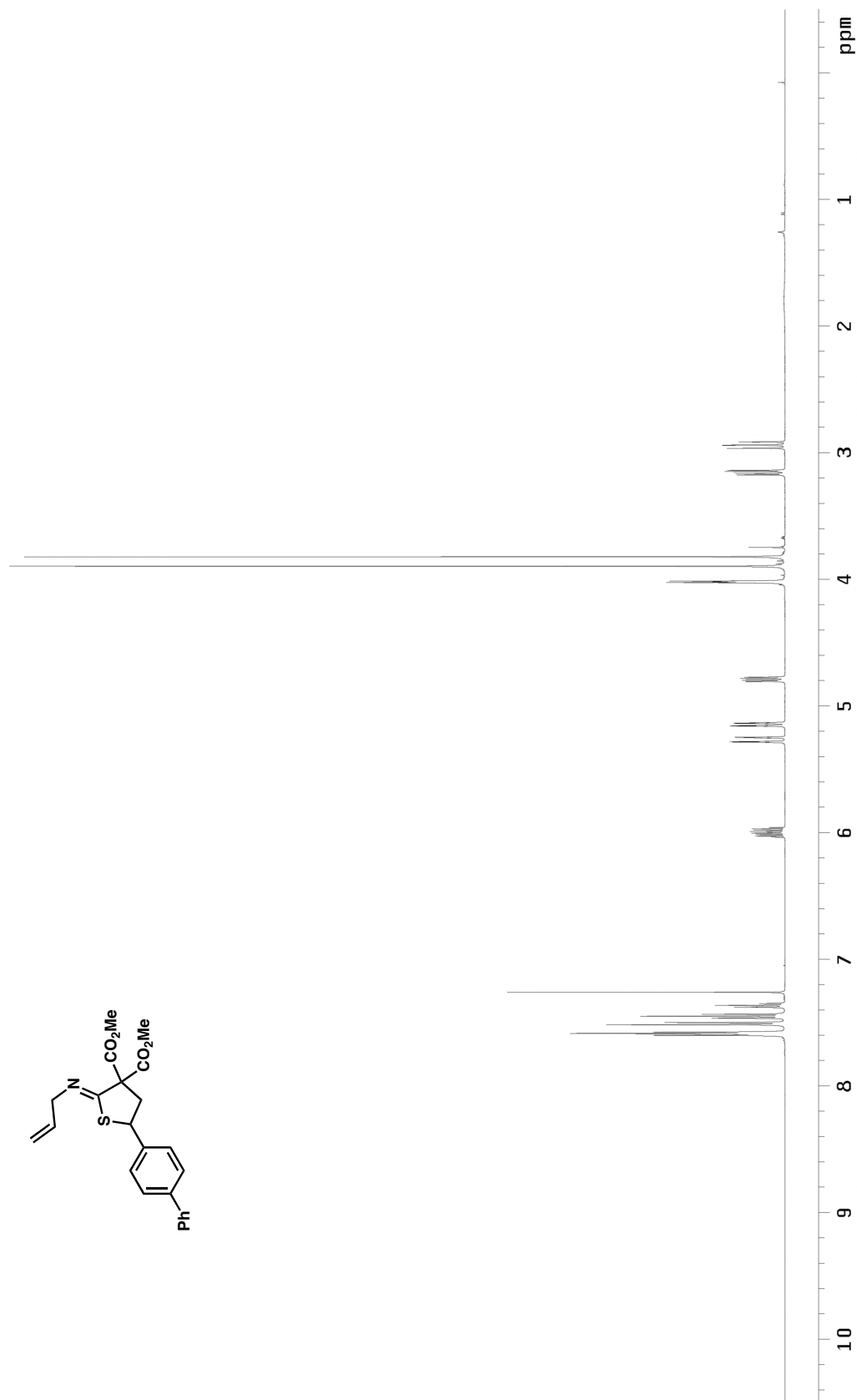


Figure A2.46 ¹H NMR (500 MHz, CDCl₃) of compound 47

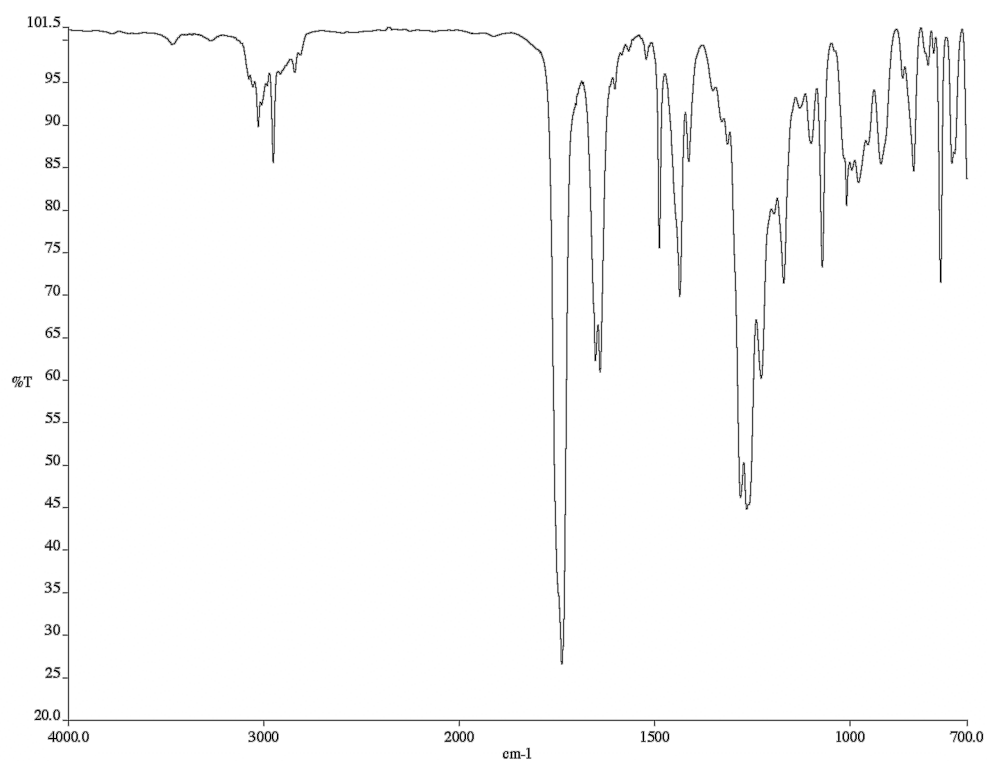


Figure A2.47 Infrared spectrum (thin film/NaCl) of compound **47**

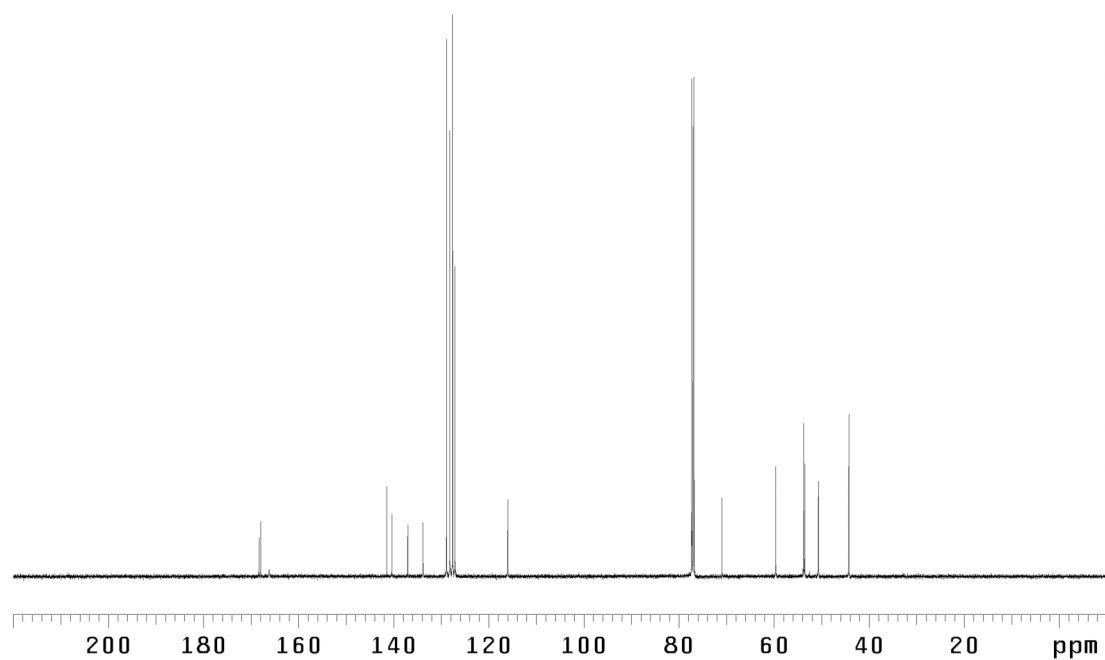


Figure A2.48 ¹³C NMR (126 MHz, CDCl₃) of compound **47**

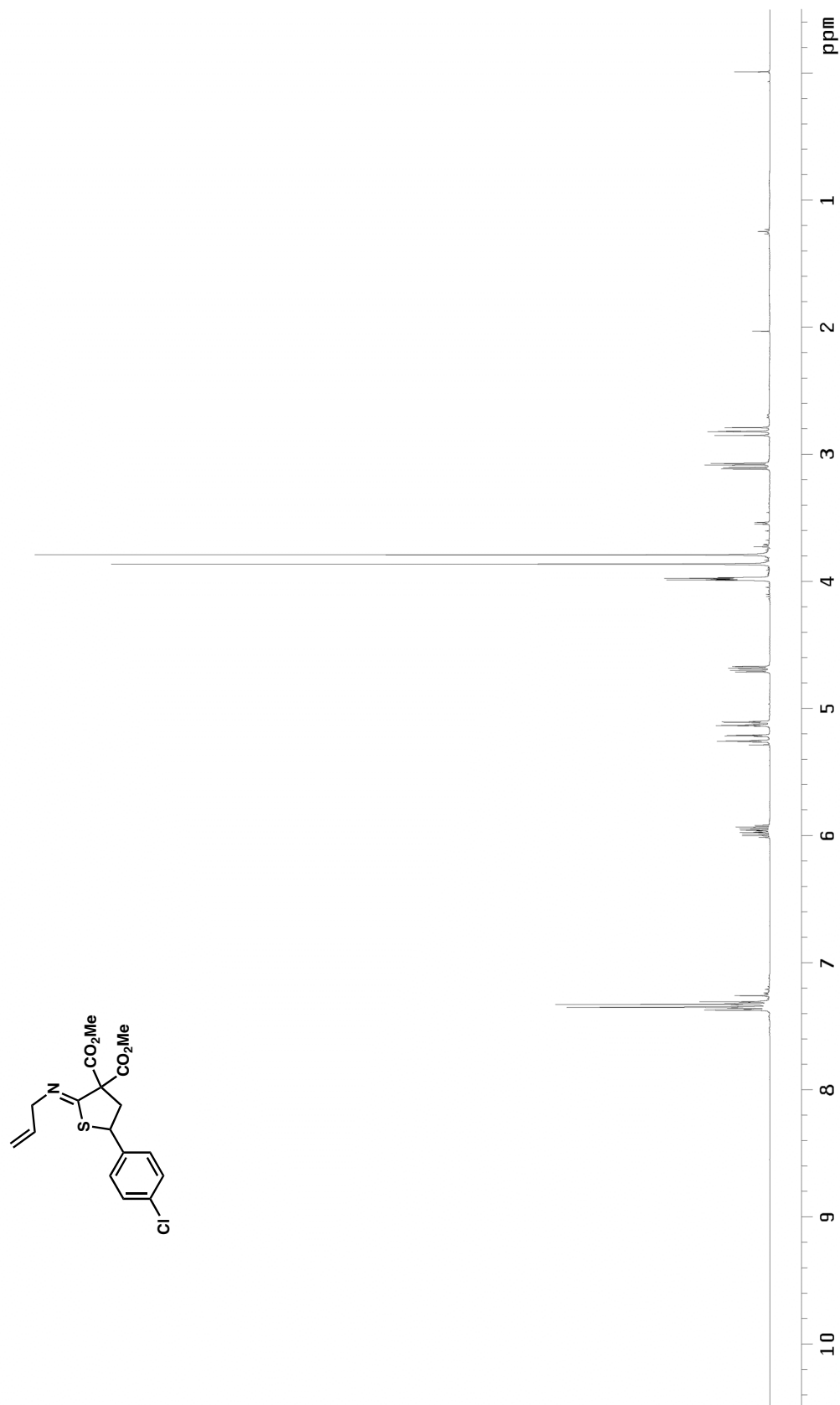


Figure A2.49 ^1H NMR (500 MHz, CDCl_3) of compound **48**

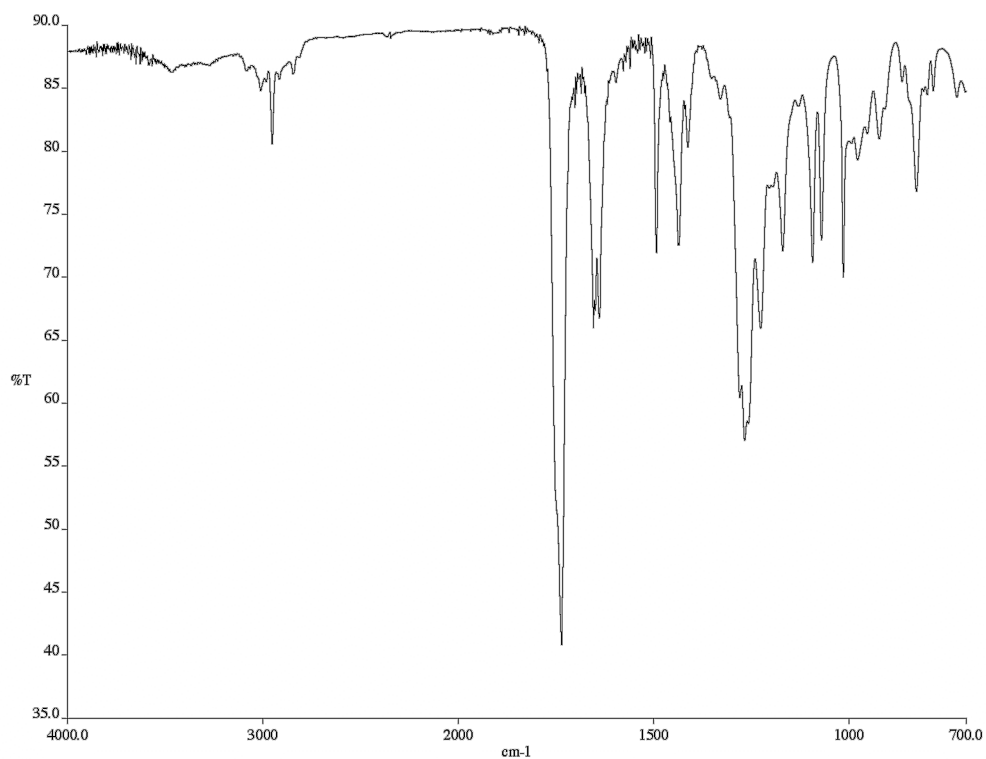


Figure A2.50 Infrared spectrum (thin film/NaCl) of compound **48**

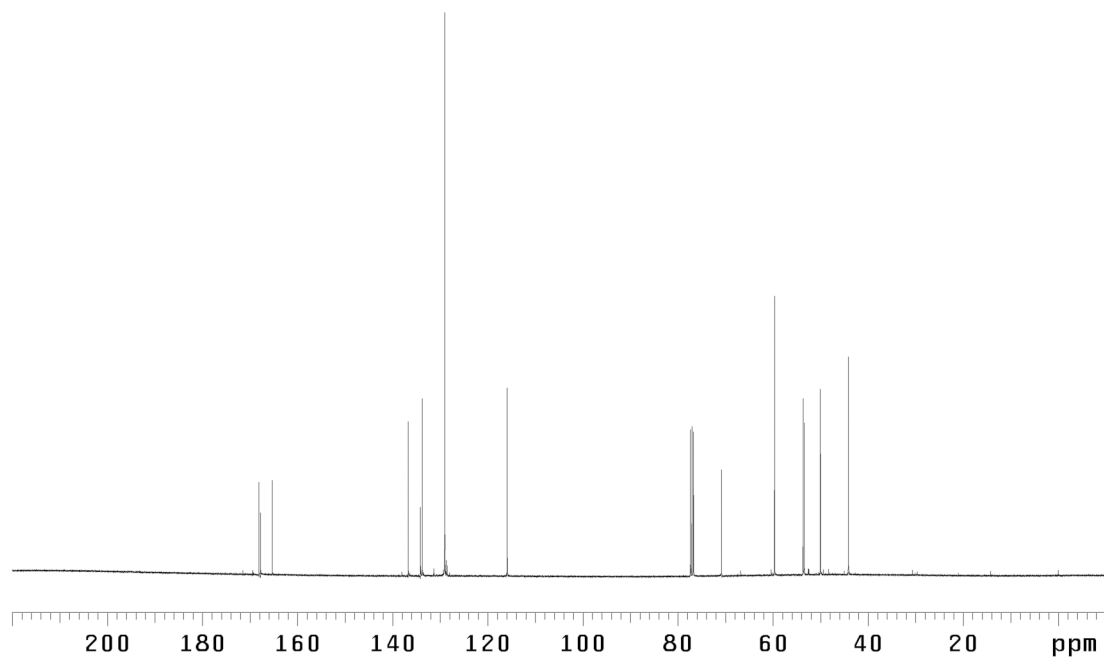


Figure A2.51 ¹³C NMR (126 MHz, CDCl₃) of compound **48**

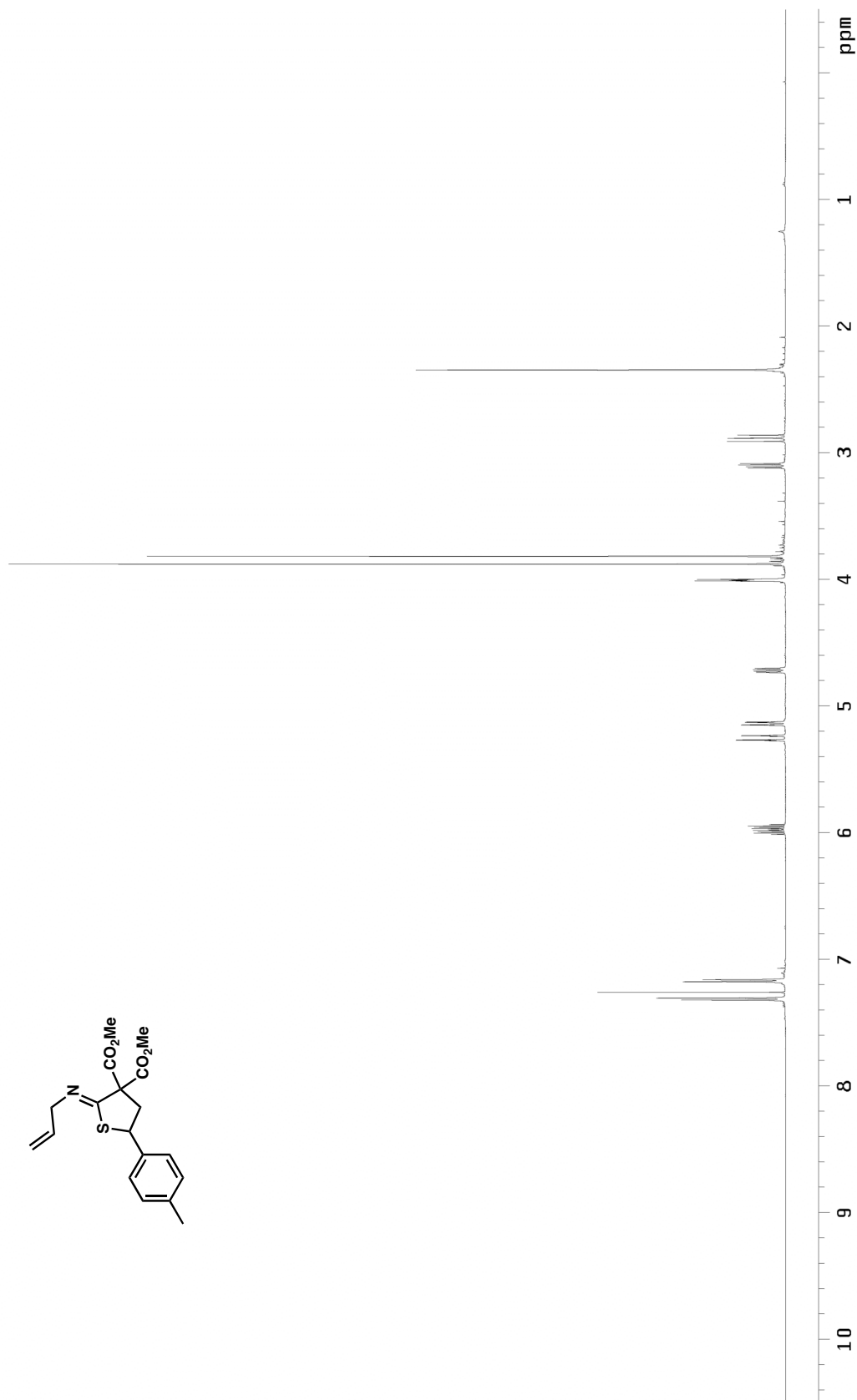


Figure A2.52 ¹H NMR (500 MHz, CDCl₃) of compound **49**

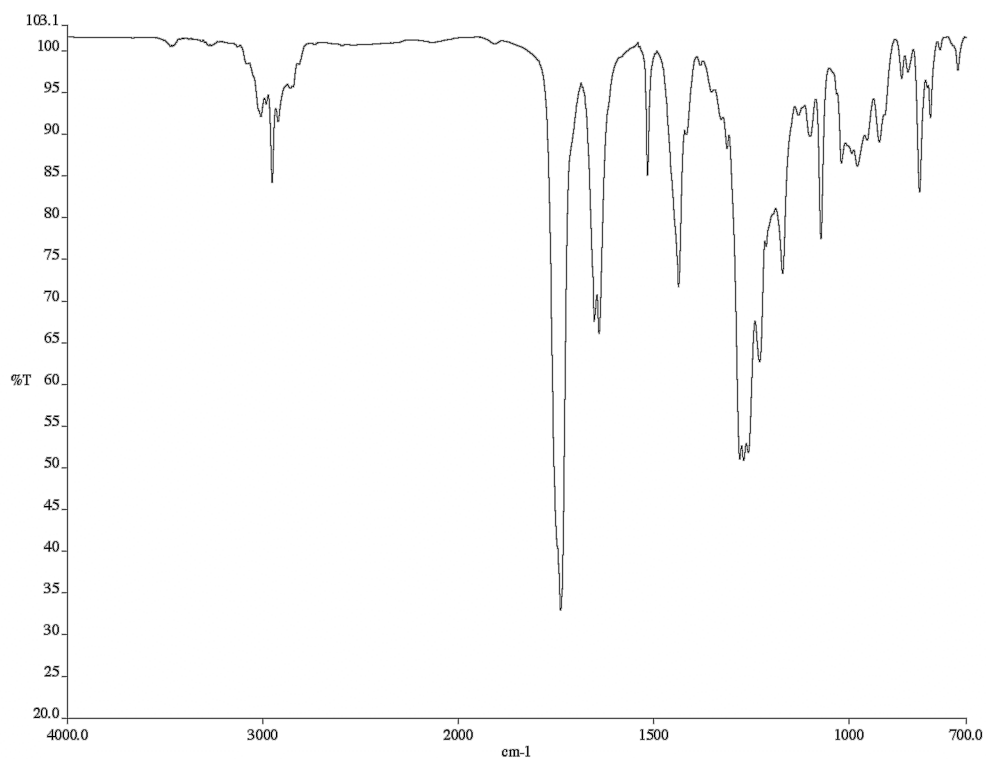


Figure A2.53 Infrared spectrum (thin film/NaCl) of compound **49**

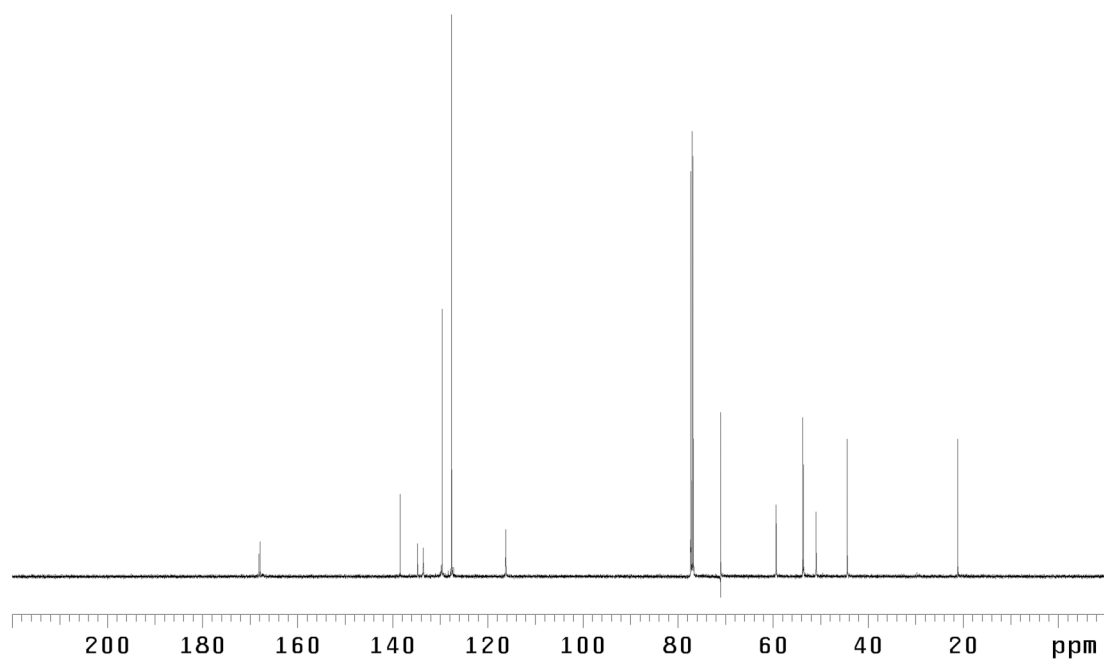


Figure A2.54 ¹³C NMR (126 MHz, CDCl₃) of compound **49**

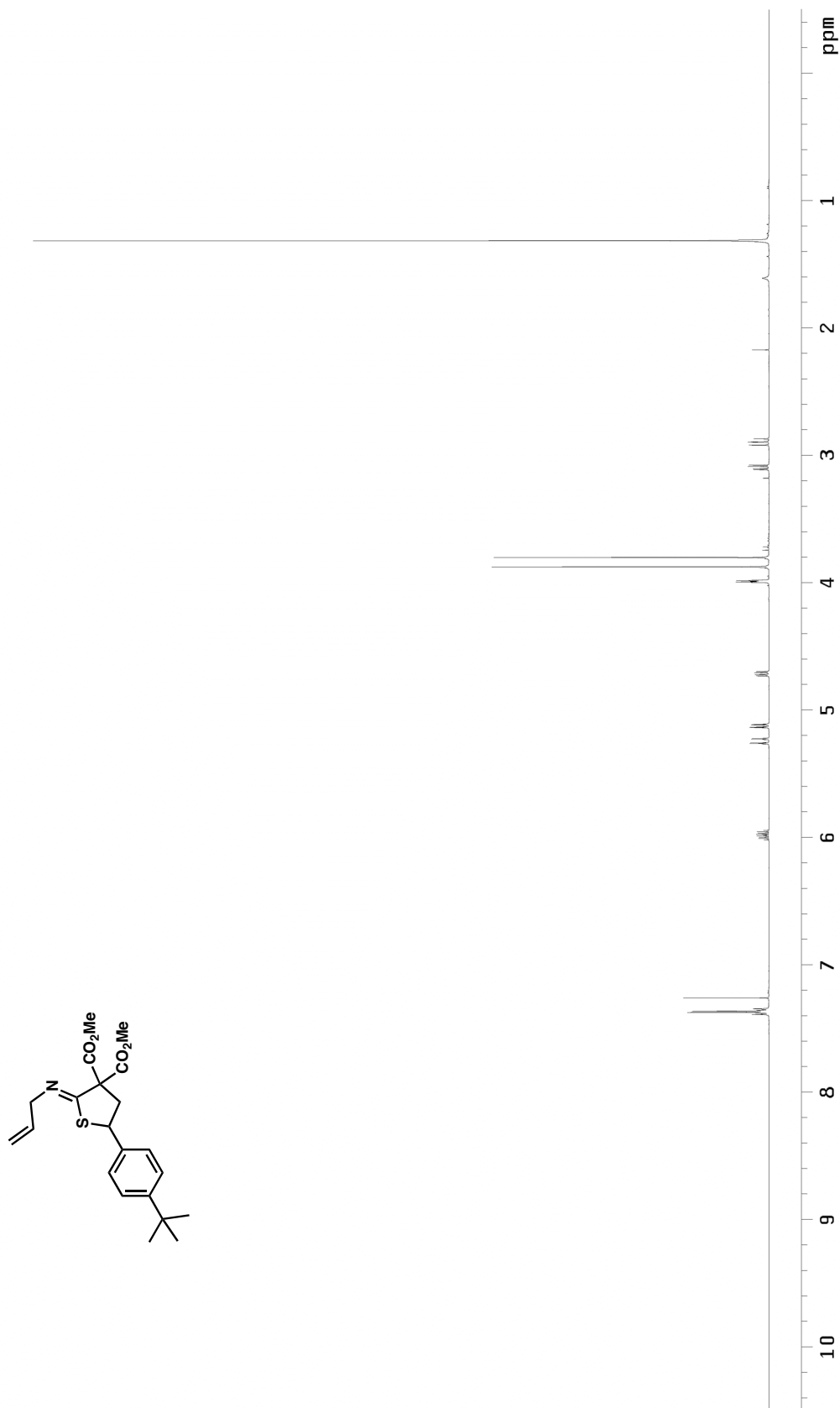


Figure A2.55 ¹H NMR (500 MHz, CDCl₃) of compound **50**

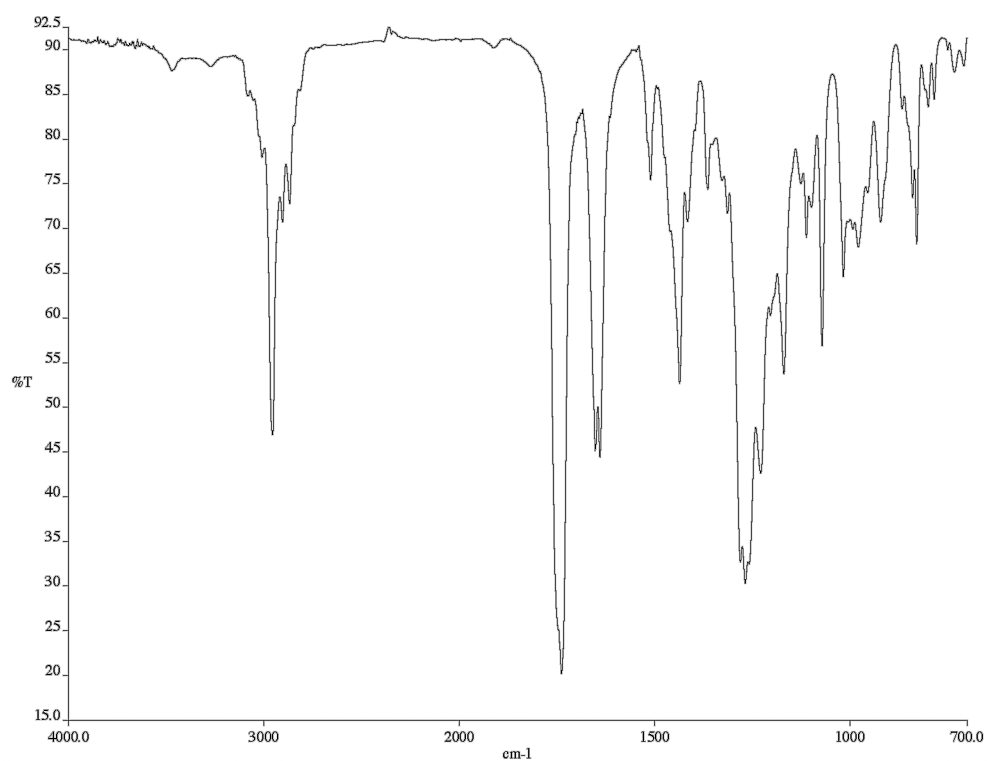


Figure A2.56 Infrared spectrum (thin film/NaCl) of compound **50**

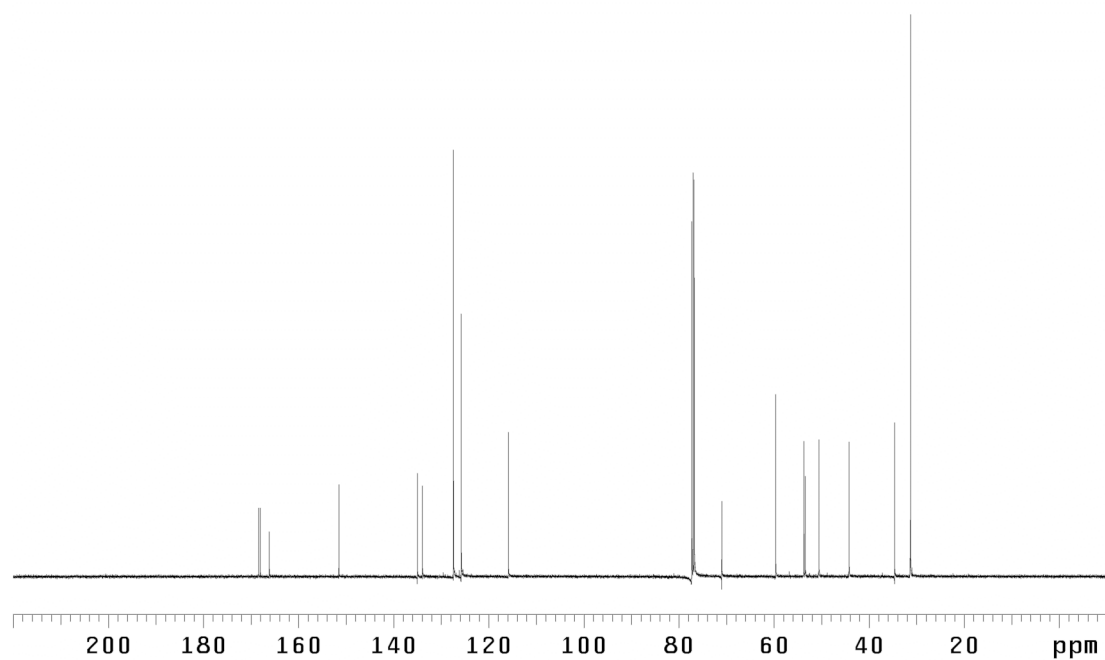


Figure A2.57 ¹³C NMR (126 MHz, CDCl₃) of compound **50**

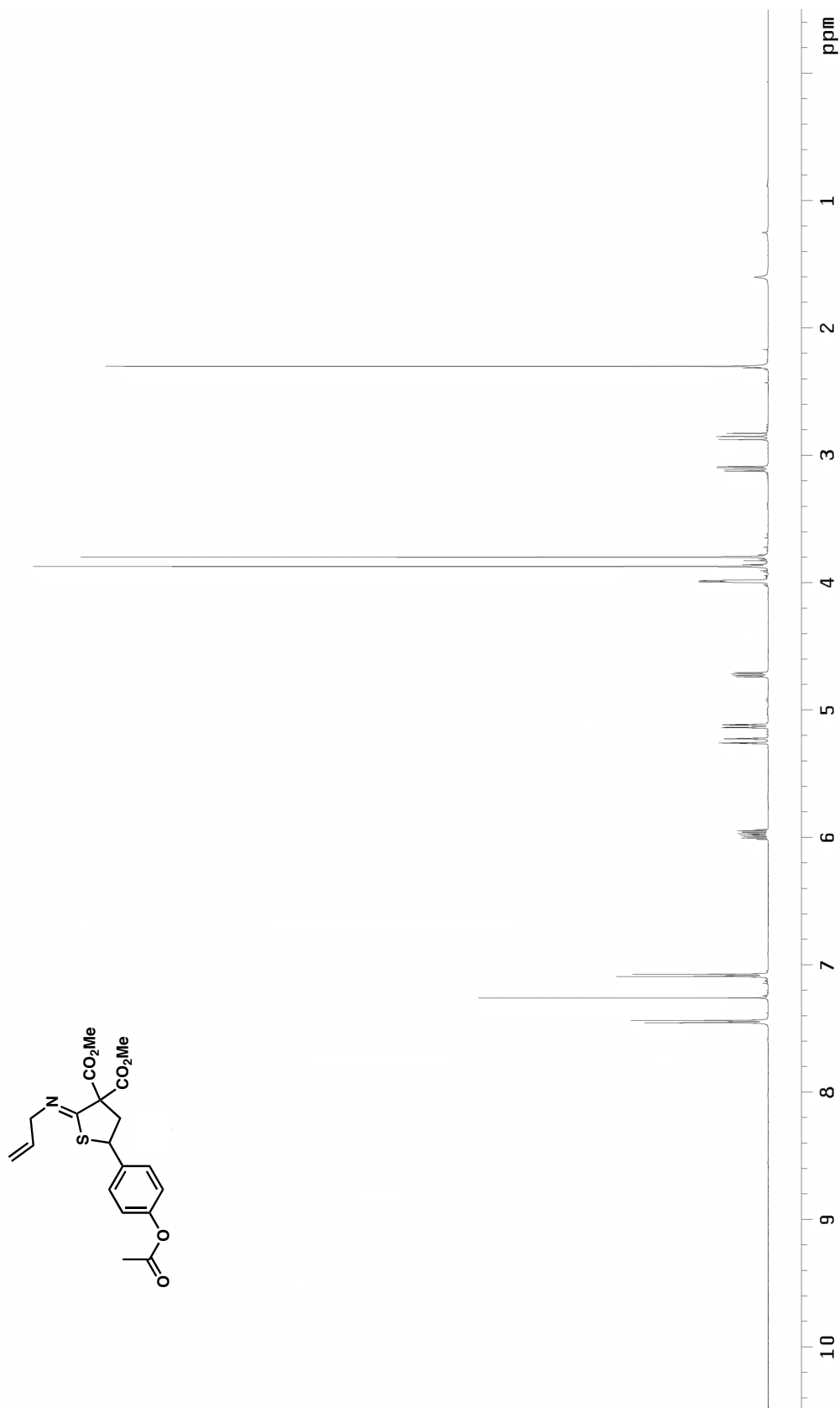


Figure A2.58 ^1H NMR (500 MHz, CDCl_3) of compound **51**

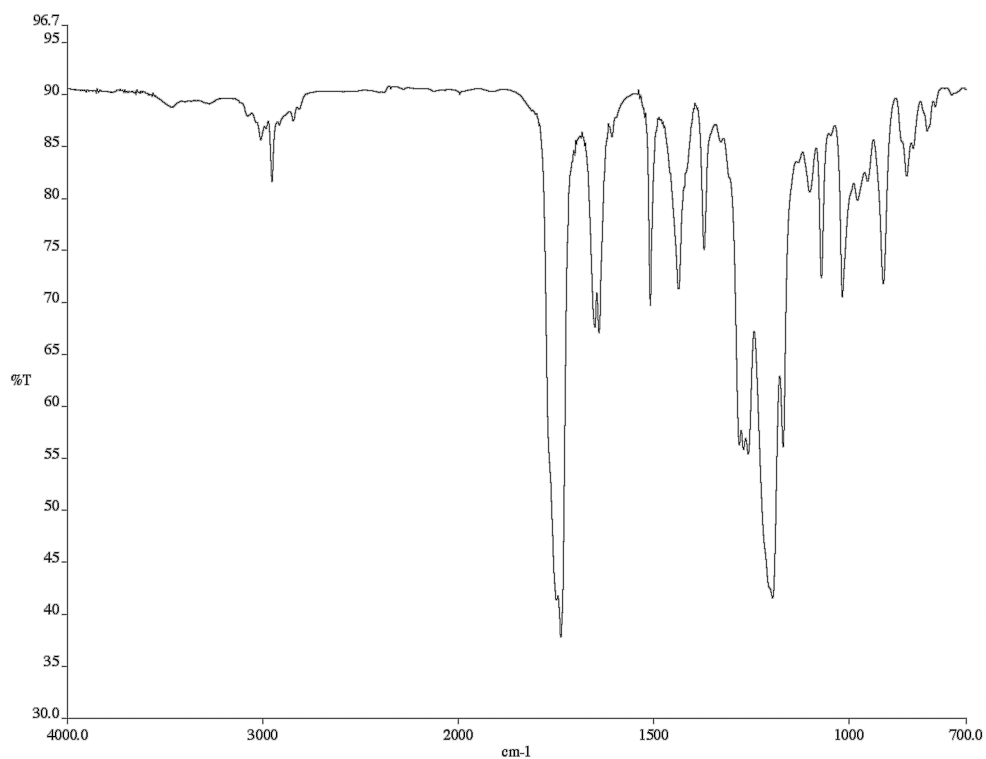


Figure A2.59 Infrared spectrum (thin film/NaCl) of compound **51**

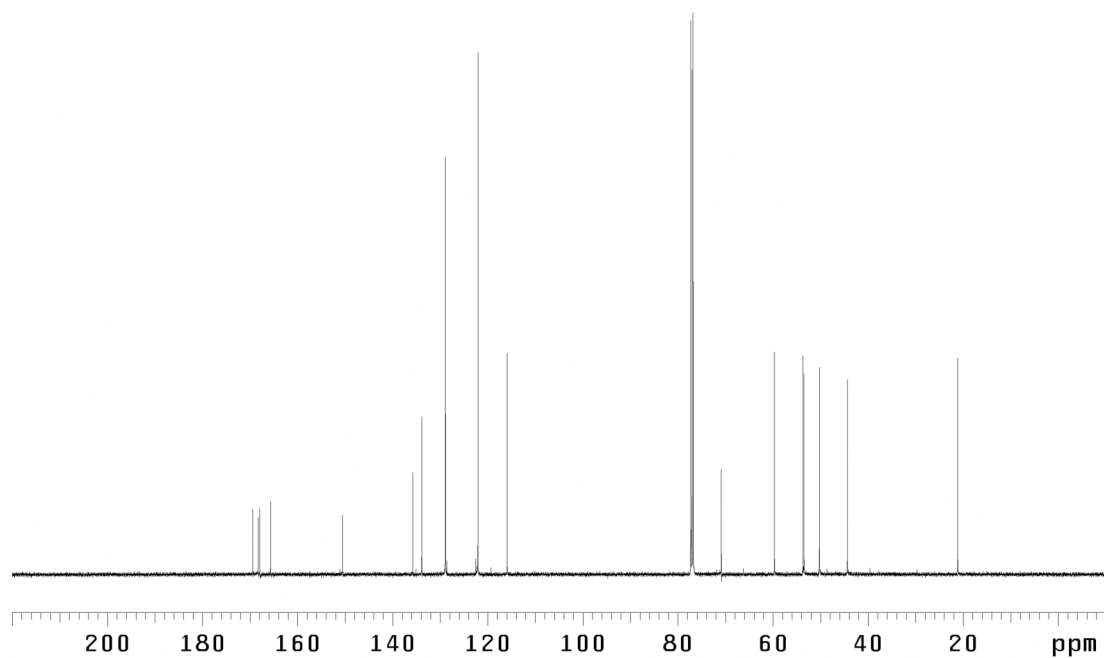


Figure A2.60 ¹³C NMR (126 MHz, CDCl₃) of compound **51**

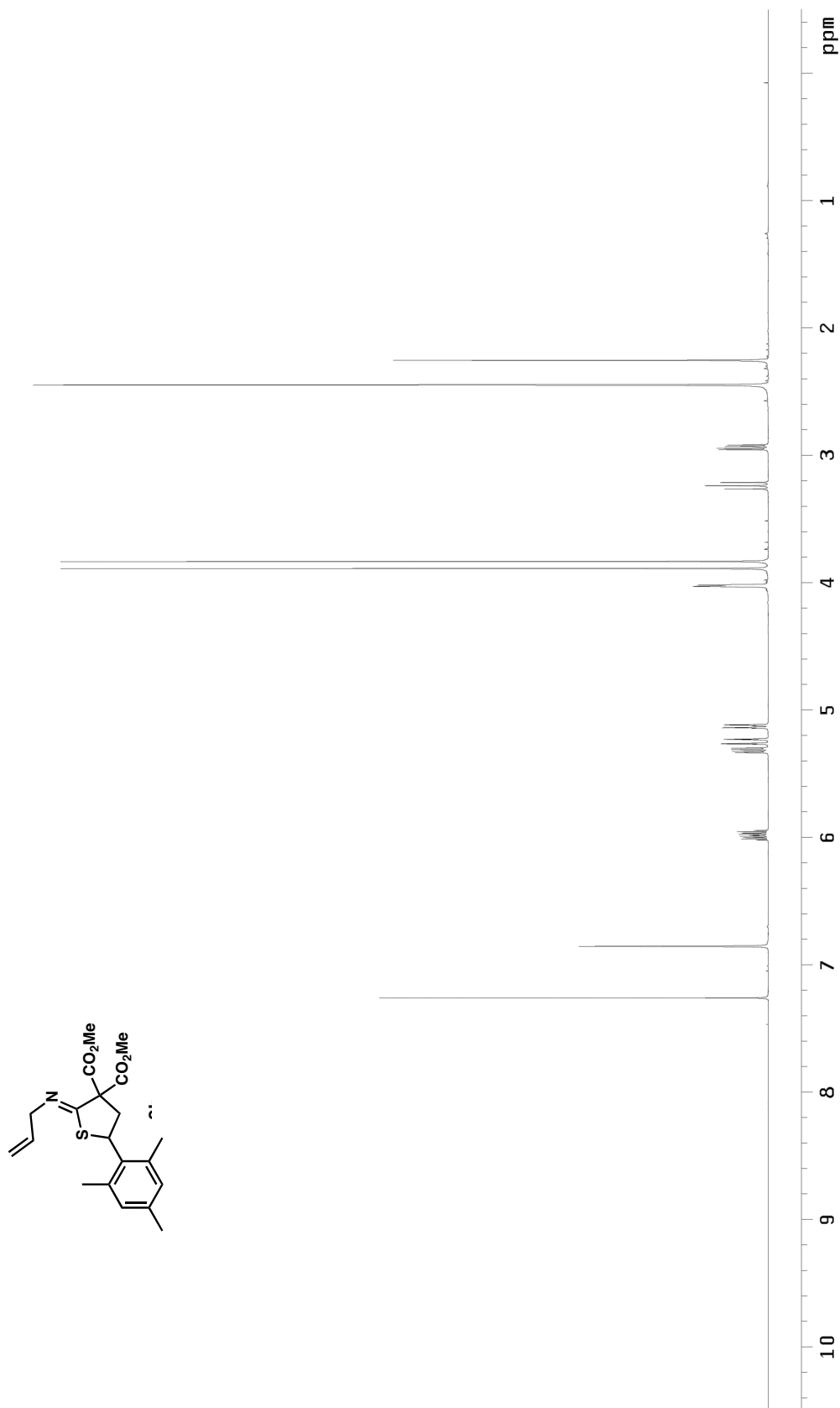


Figure A2.61 ^1H NMR (500 MHz, CDCl_3) of compound **52**

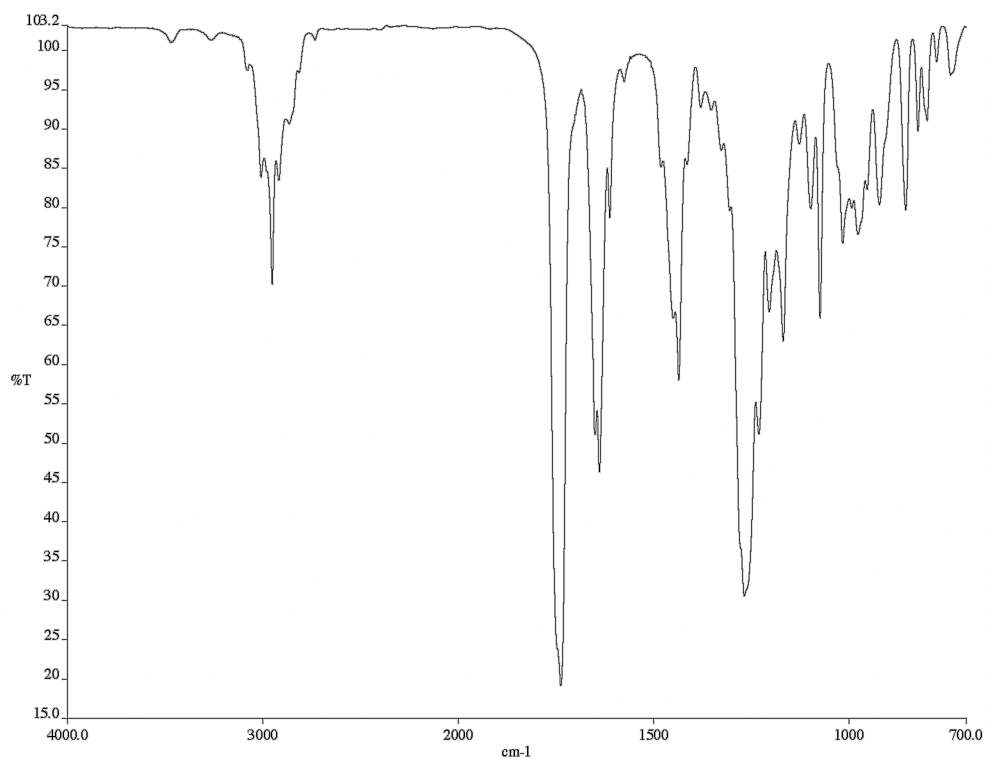


Figure A2.62 Infrared spectrum (thin film/NaCl) of compound **52**

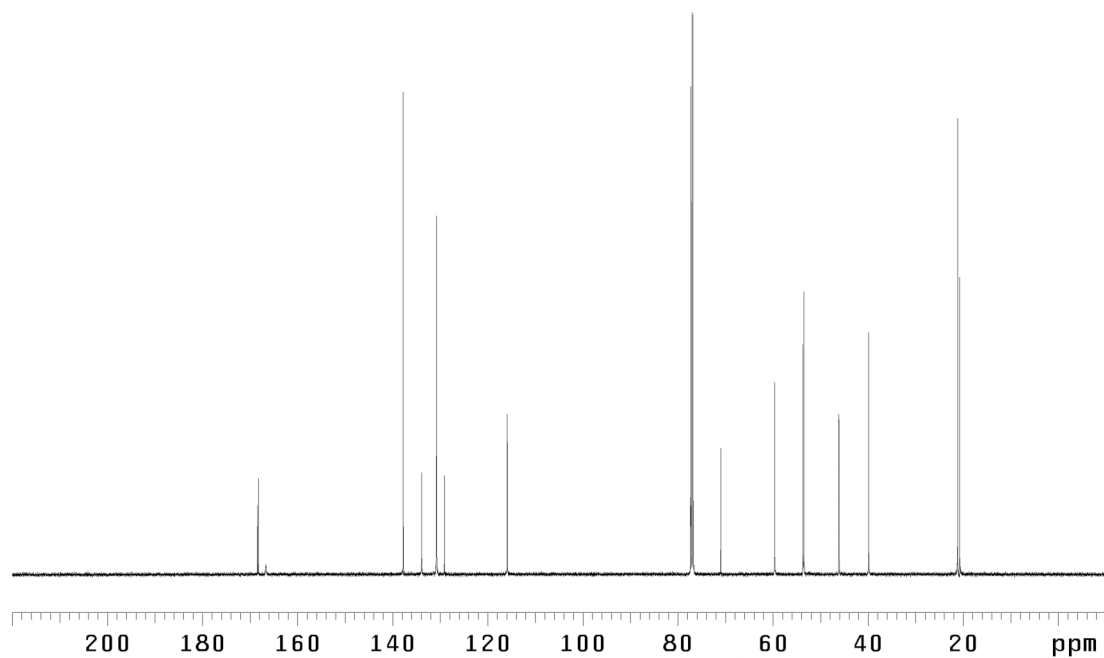


Figure A2.63 ^{13}C NMR (126 MHz, CDCl_3) of compound **52**

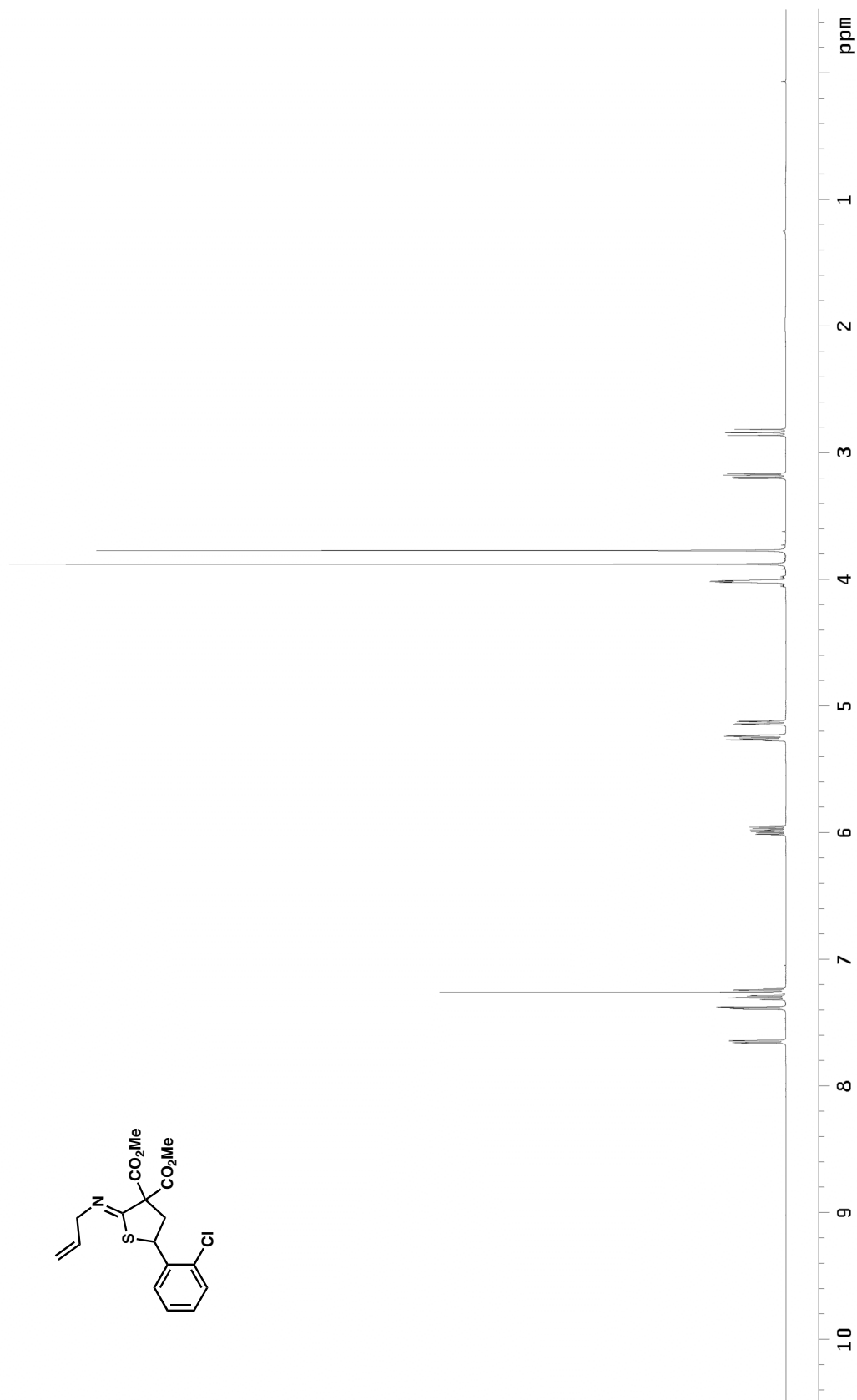


Figure A2.64 ¹H NMR (500 MHz, CDCl₃) of compound **53**

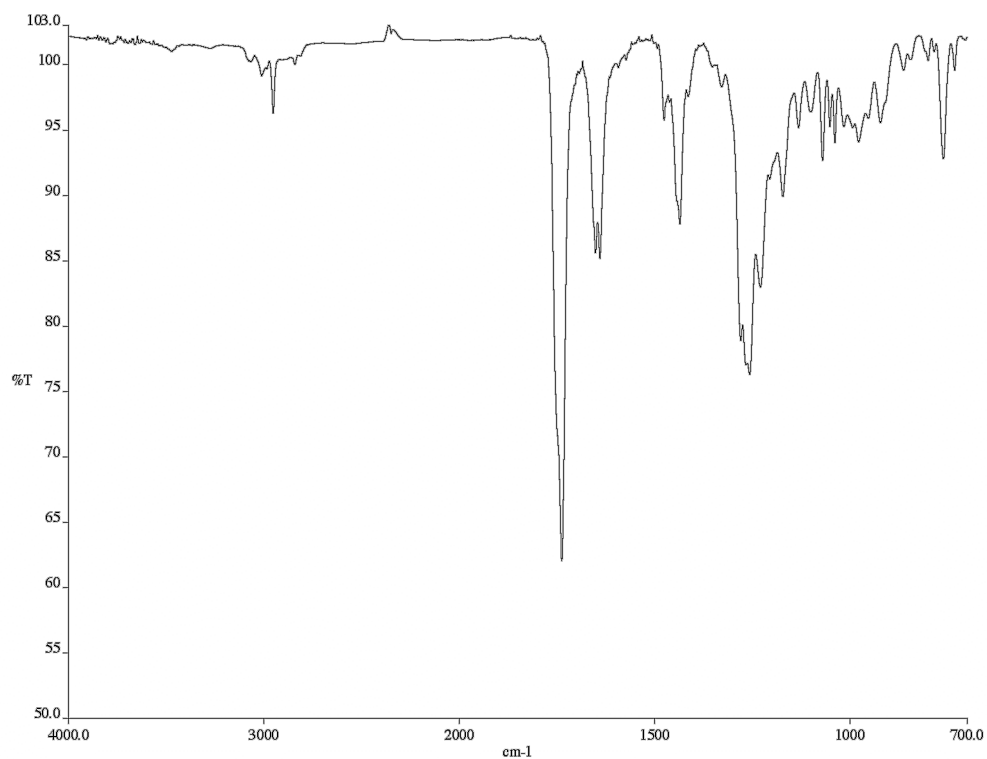


Figure A2.65 Infrared spectrum (thin film/NaCl) of compound **53**

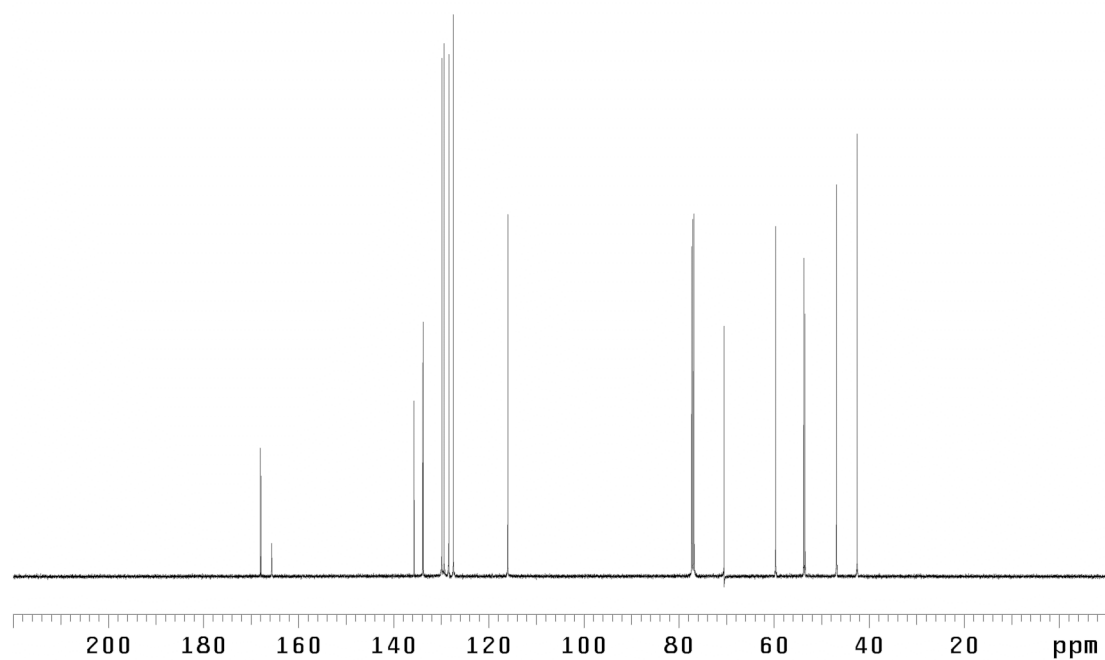


Figure A2.66 ¹³C NMR (126 MHz, CDCl₃) of compound **53**

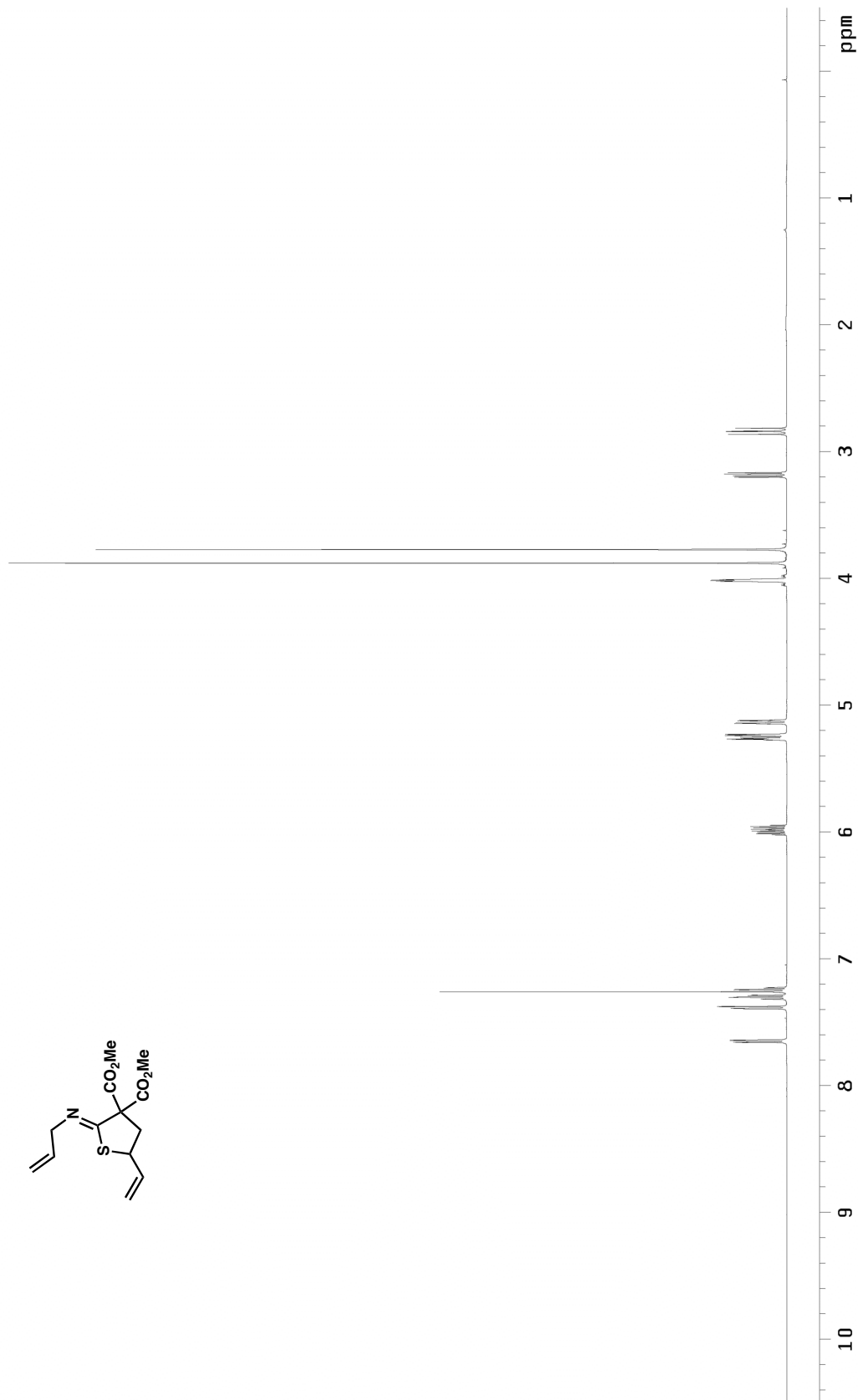


Figure A2.67 ¹H NMR (500 MHz, CDCl₃) of compound **54**

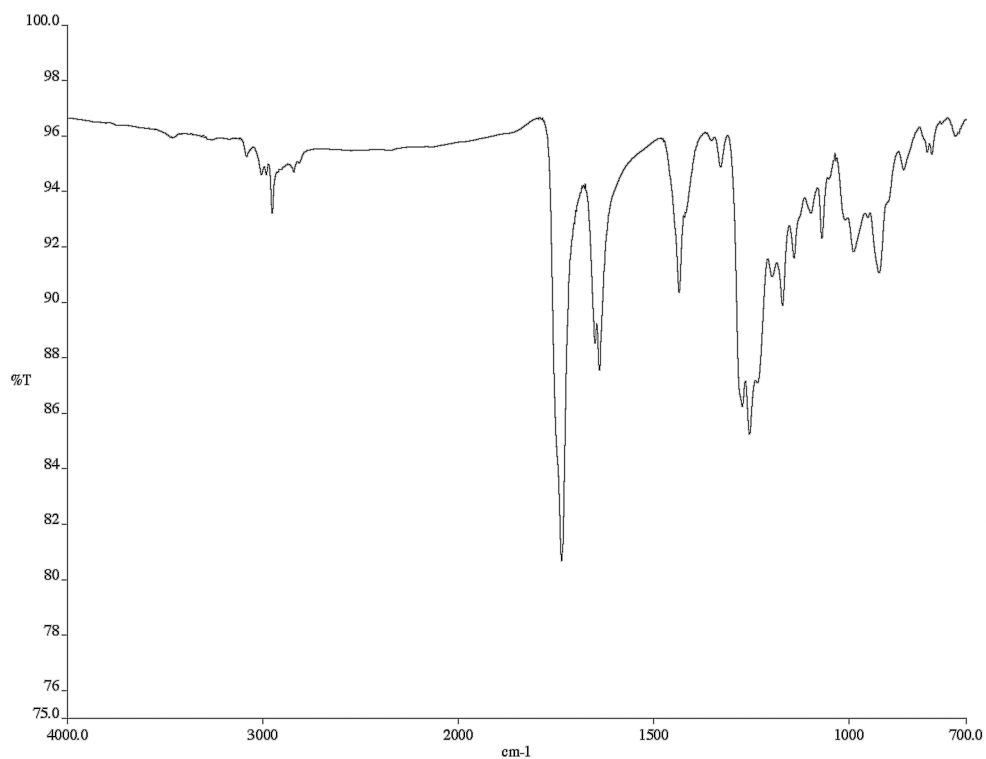


Figure A2.68 Infrared spectrum (thin film/NaCl) of compound **54**

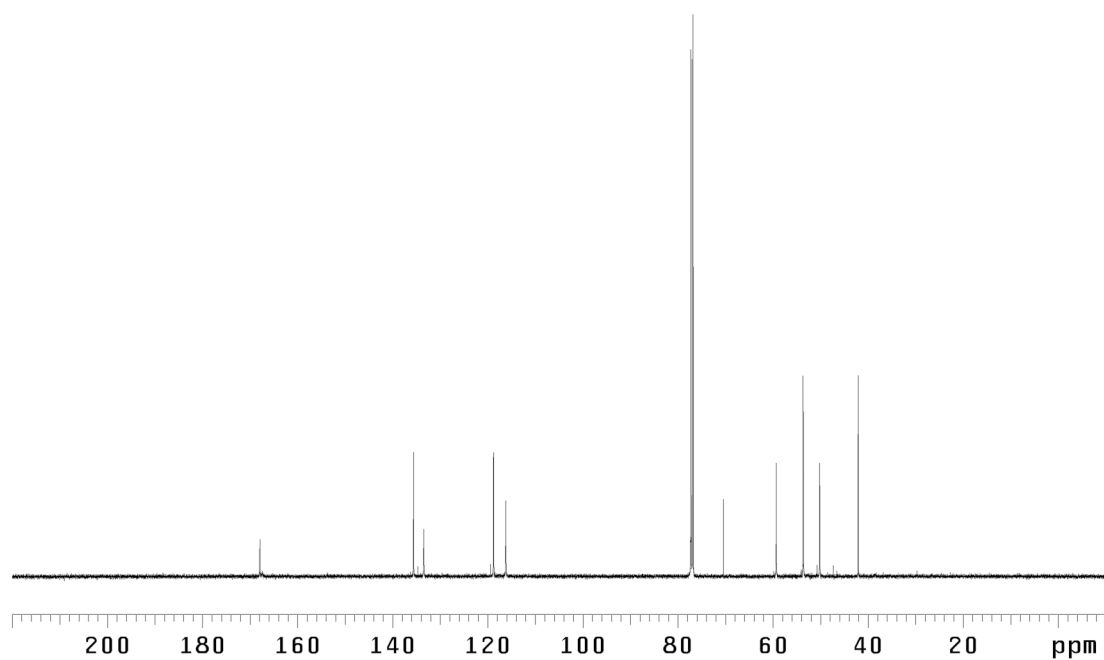


Figure A2.69 ¹³C NMR (126 MHz, CDCl₃) of compound **54**

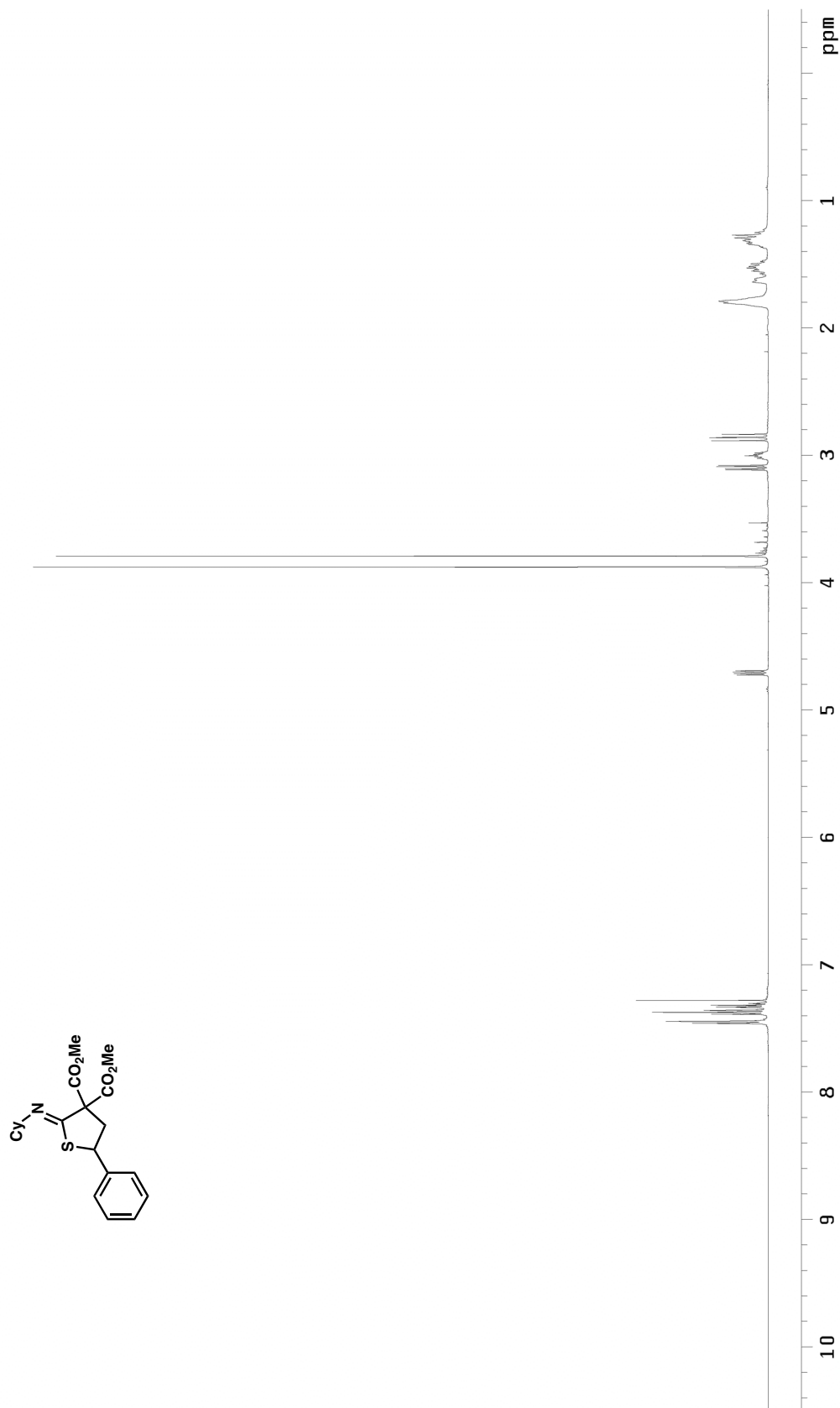


Figure A2.70 ¹H NMR (500 MHz, CDCl₃) of compound **55**

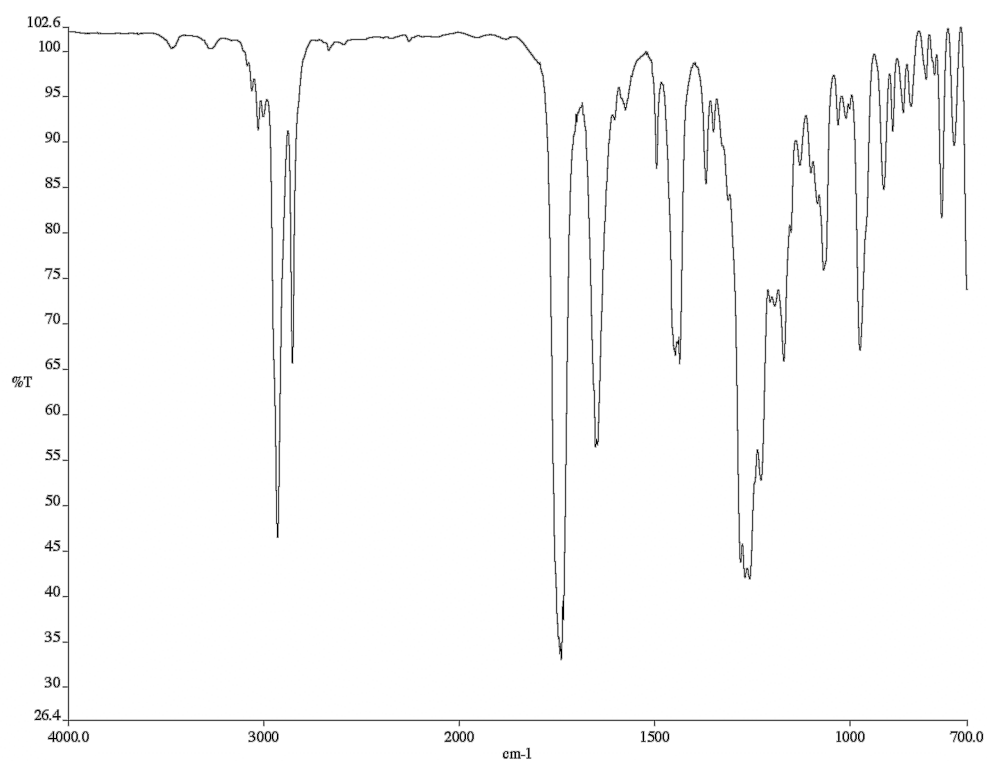


Figure A2.71 Infrared spectrum (thin film/NaCl) of compound **55**

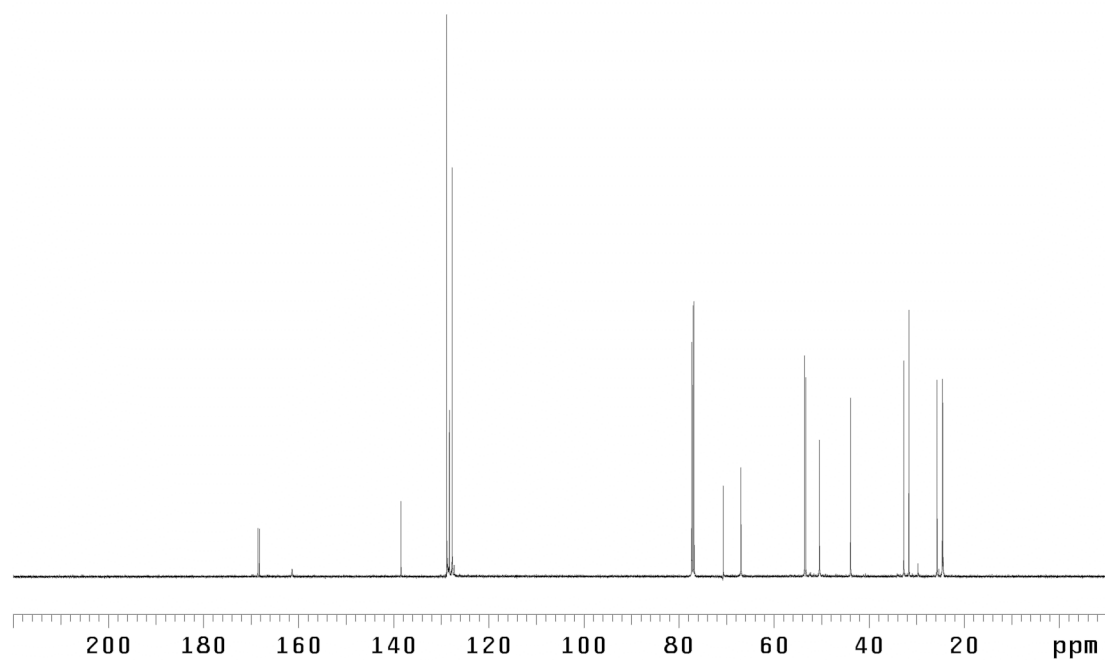


Figure A2.72 ¹³C NMR (126 MHz, CDCl₃) of compound **55**

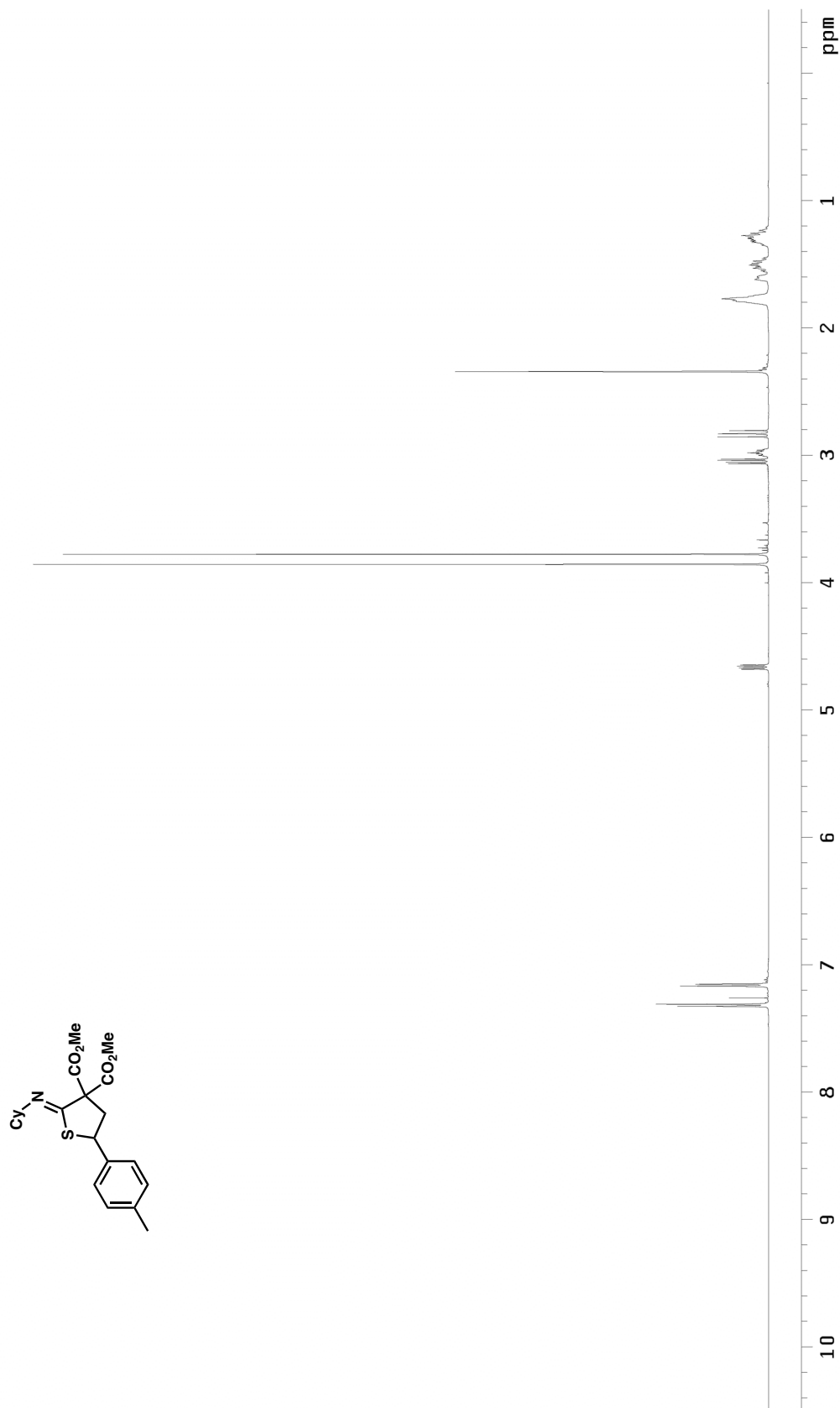


Figure A2.73 ¹H NMR (500 MHz, CDCl₃) of compound **56**

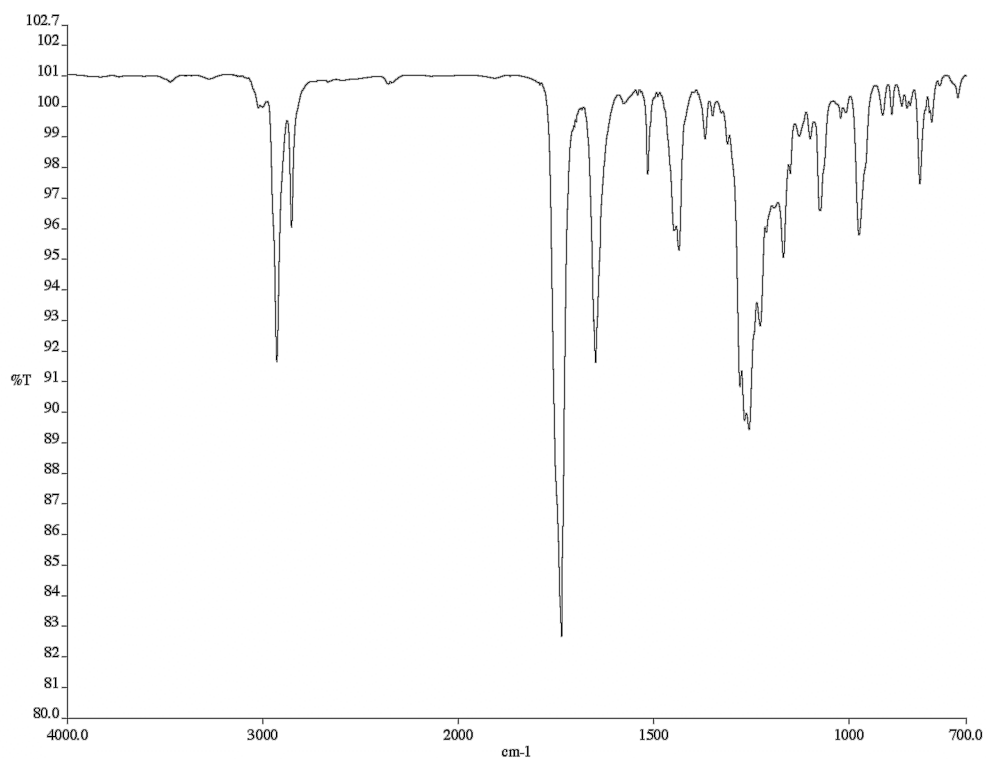


Figure A2.74 Infrared spectrum (thin film/NaCl) of compound **56**

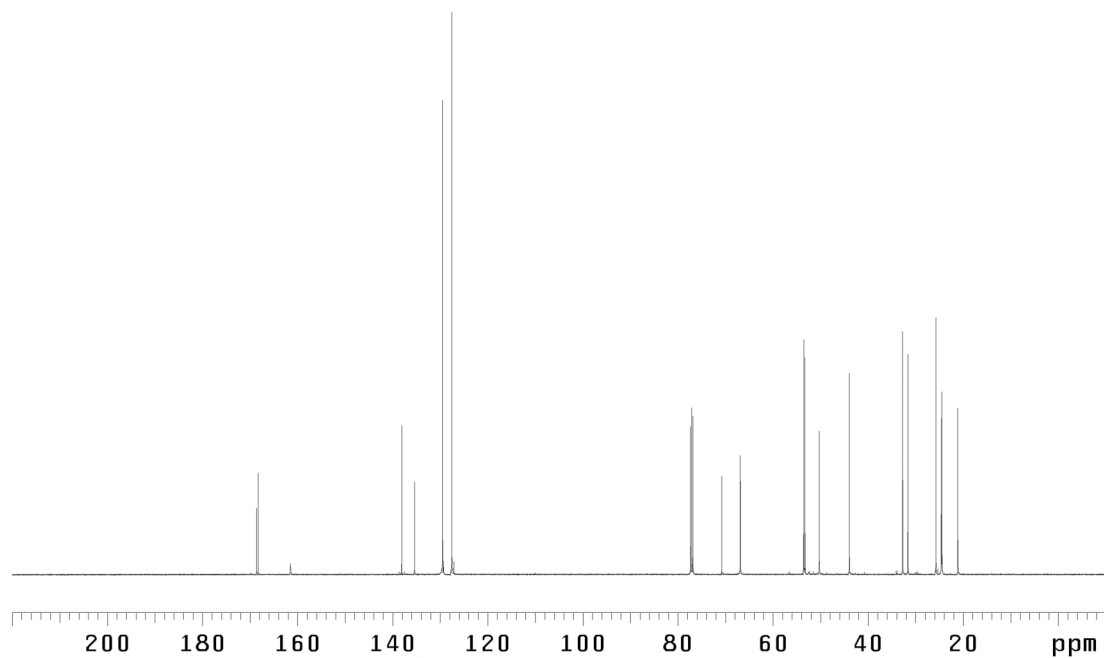


Figure A2.75 ¹³C NMR (126 MHz, CDCl₃) of compound **56**

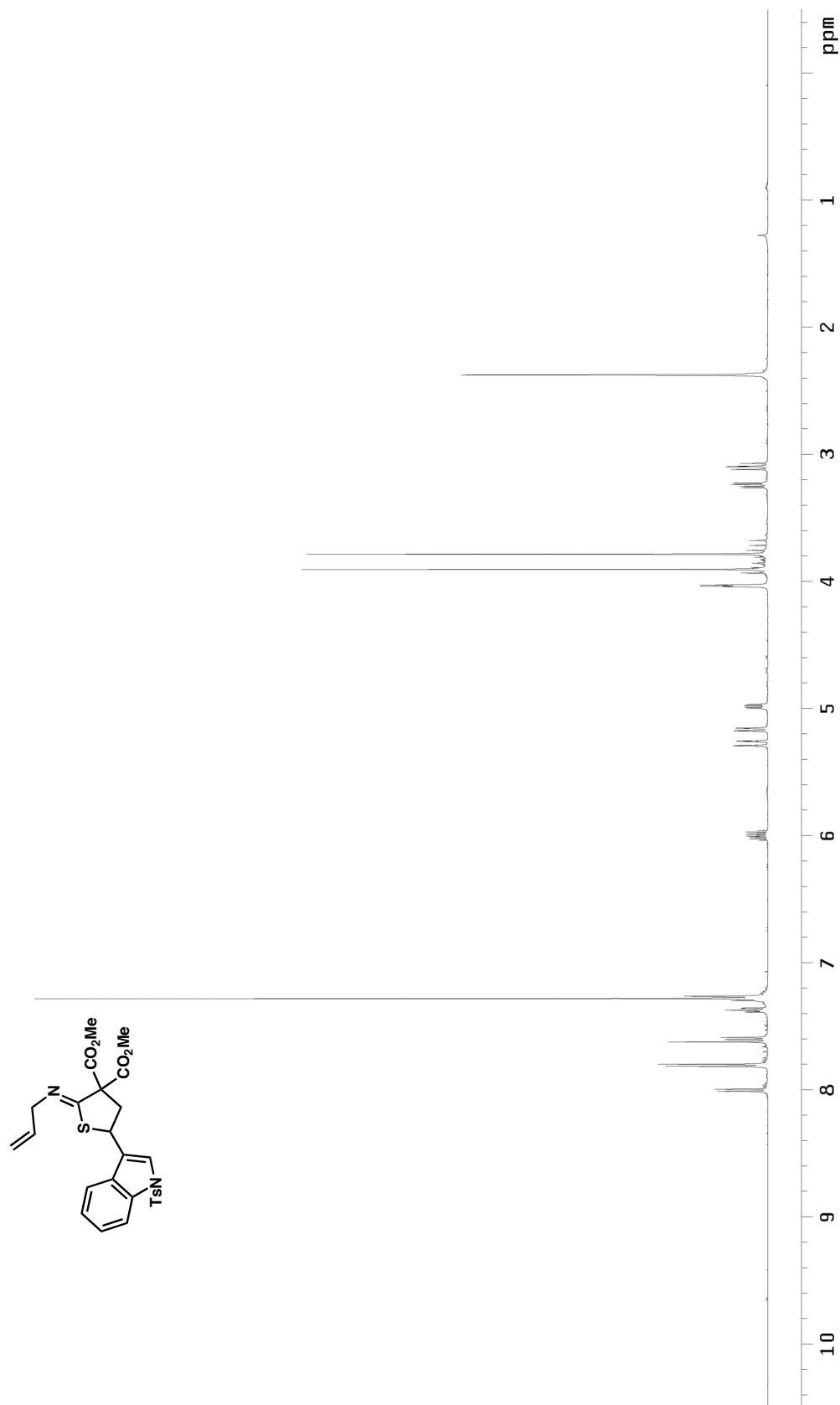


Figure A2.76 ¹H NMR (500 MHz, CDCl₃) of compound **57**

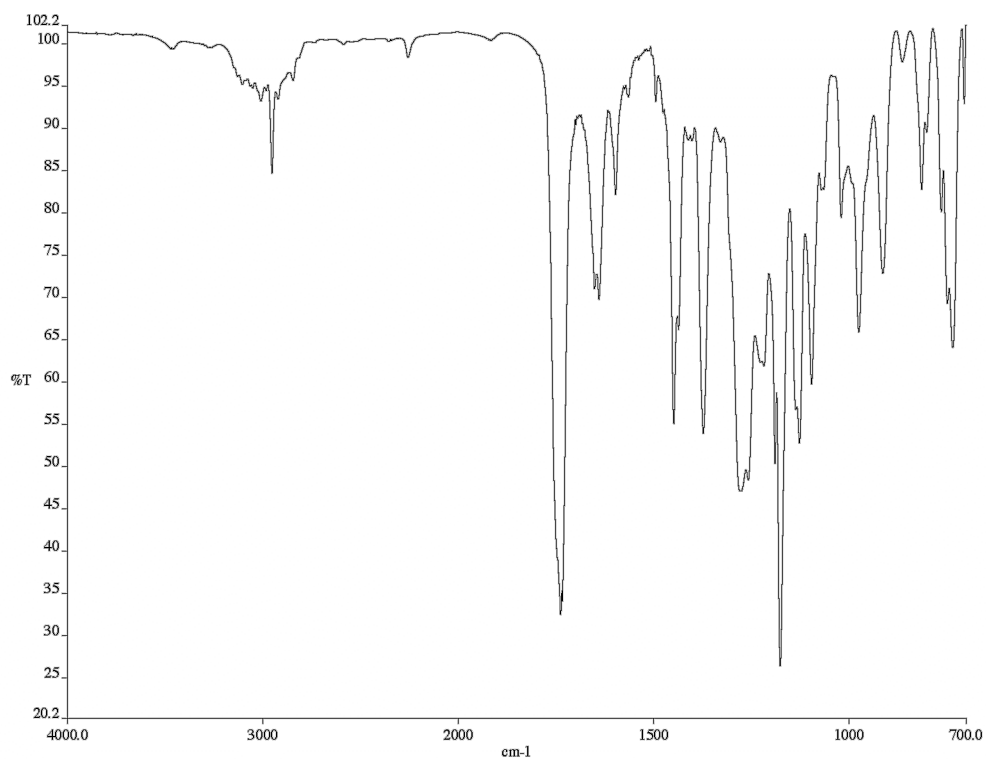


Figure A2.77 Infrared spectrum (thin film/NaCl) of compound **57**

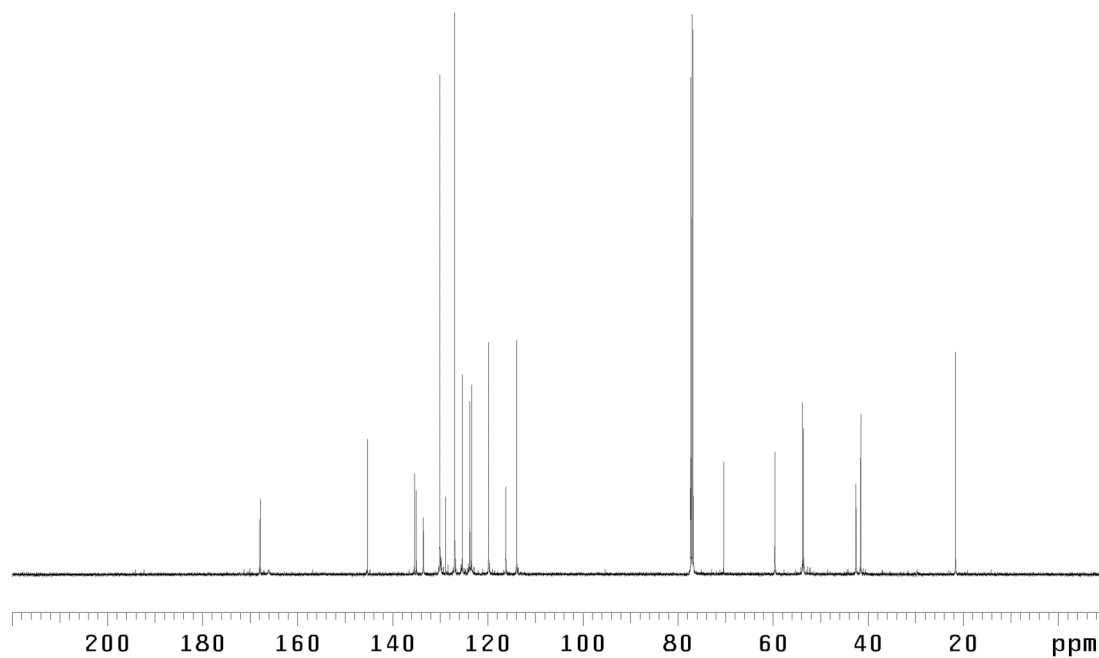


Figure A2.78 ¹³C NMR (126 MHz, CDCl₃) of compound **57**

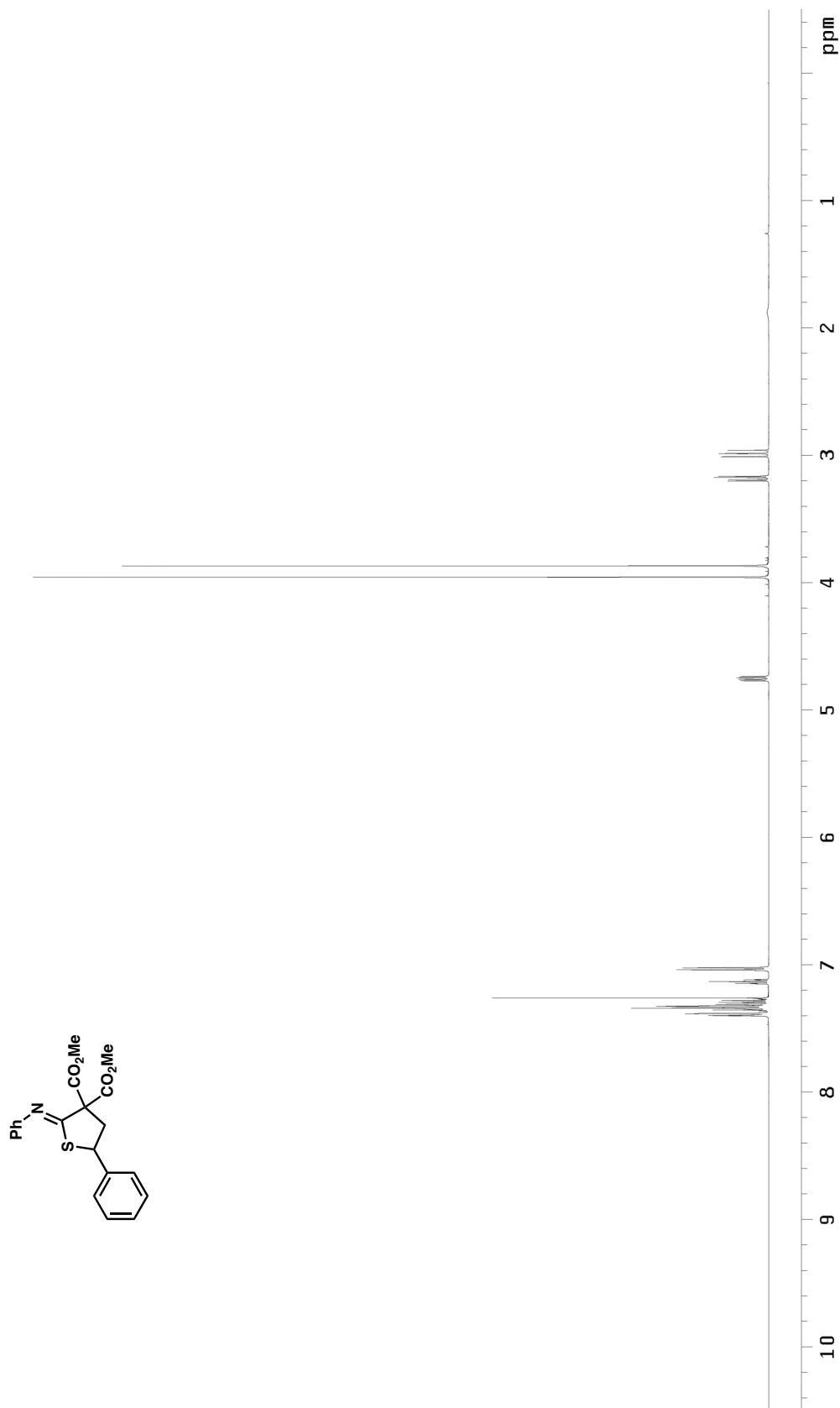


Figure A2.79 ¹H NMR (500 MHz, CDCl₃) of compound **44**

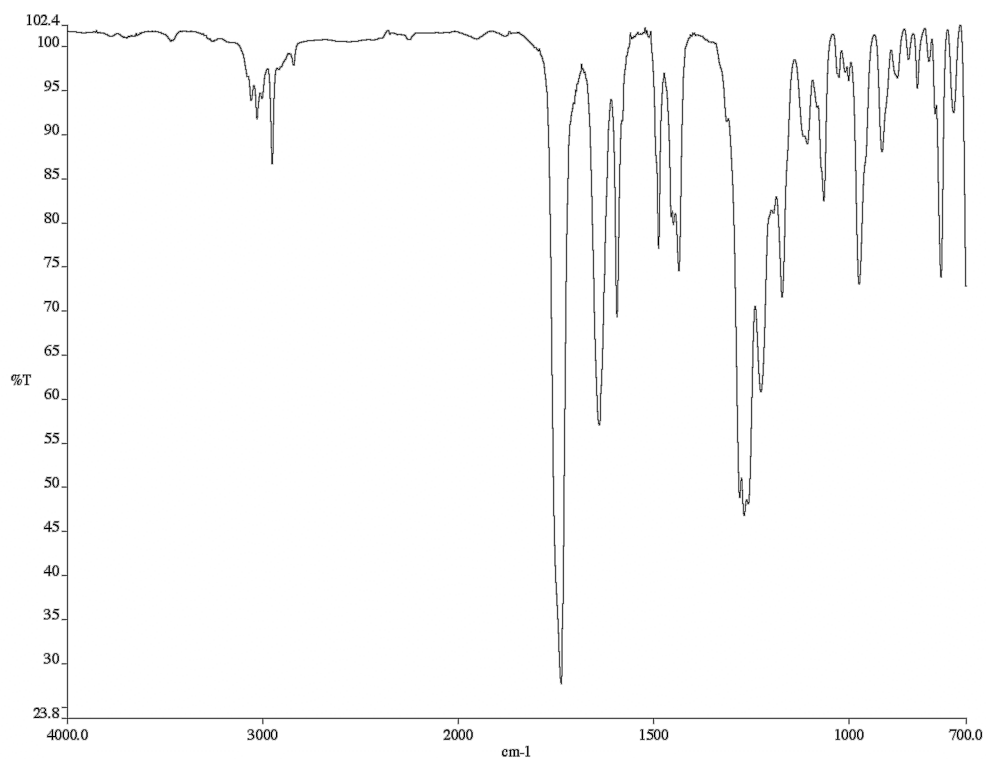


Figure A2.80 Infrared spectrum (thin film/NaCl) of compound **44**

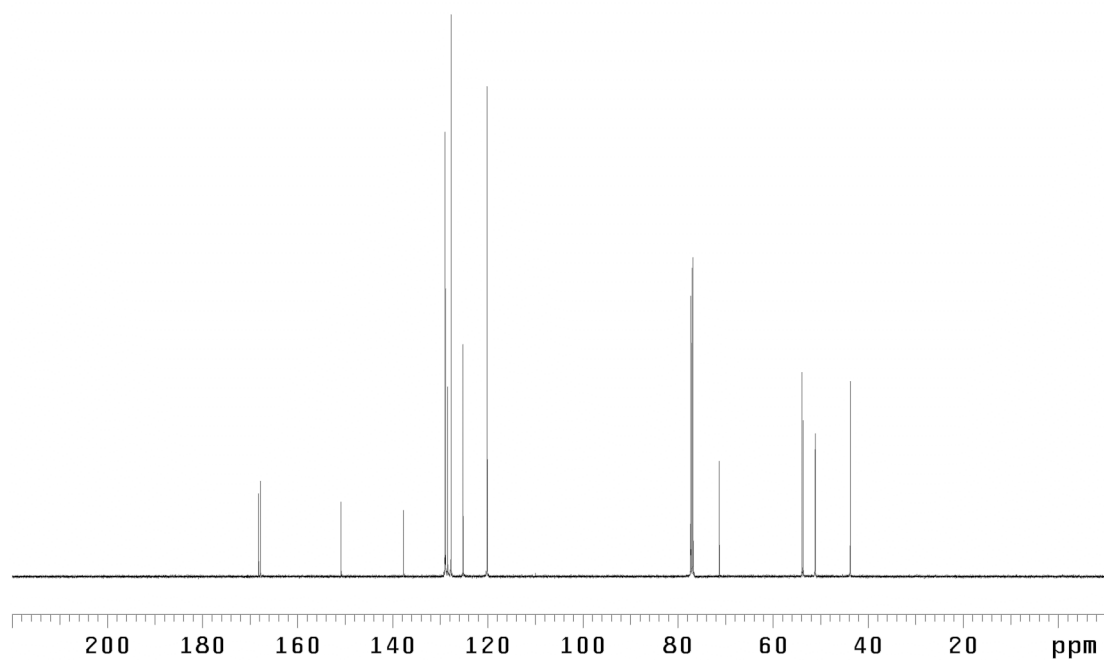


Figure A2.81 ¹³C NMR (126 MHz, CDCl₃) of compound **44**

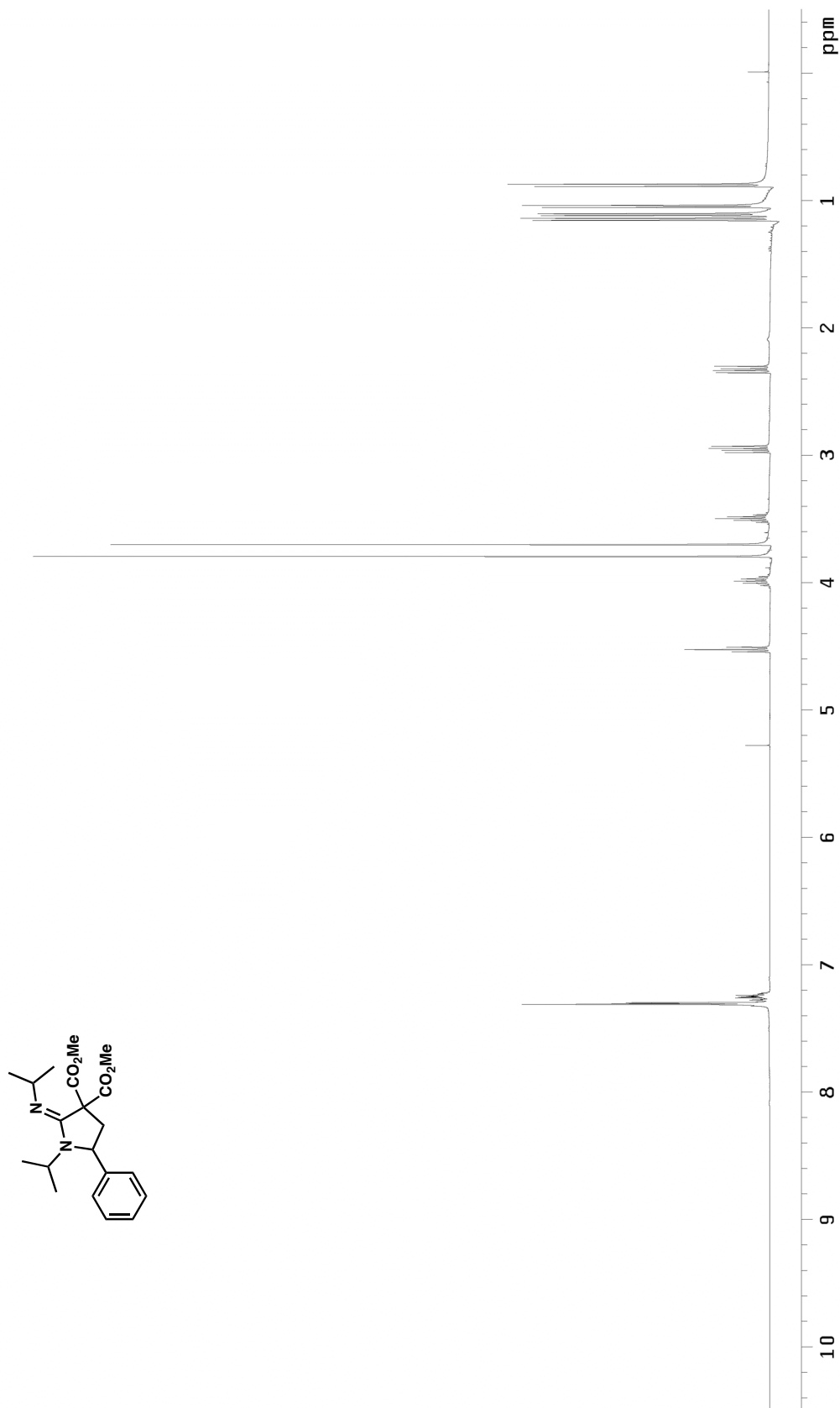


Figure A2.82 ^1H NMR (400 MHz, CDCl_3) of compound **60**

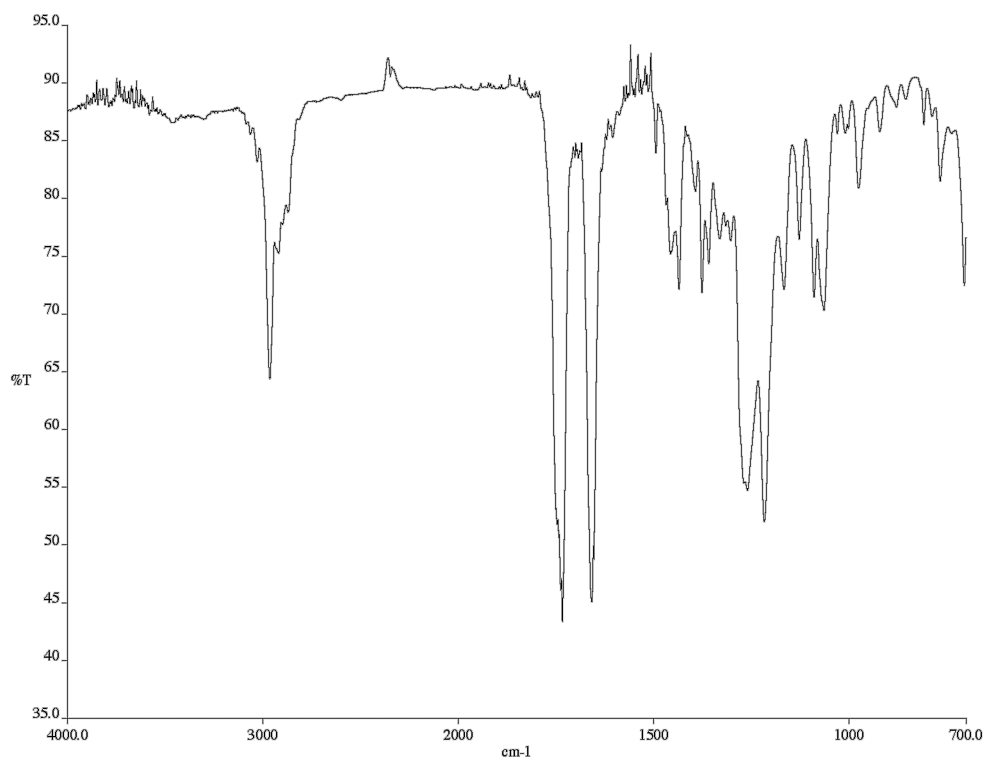


Figure A2.83 Infrared spectrum (thin film/NaCl) of compound **60**

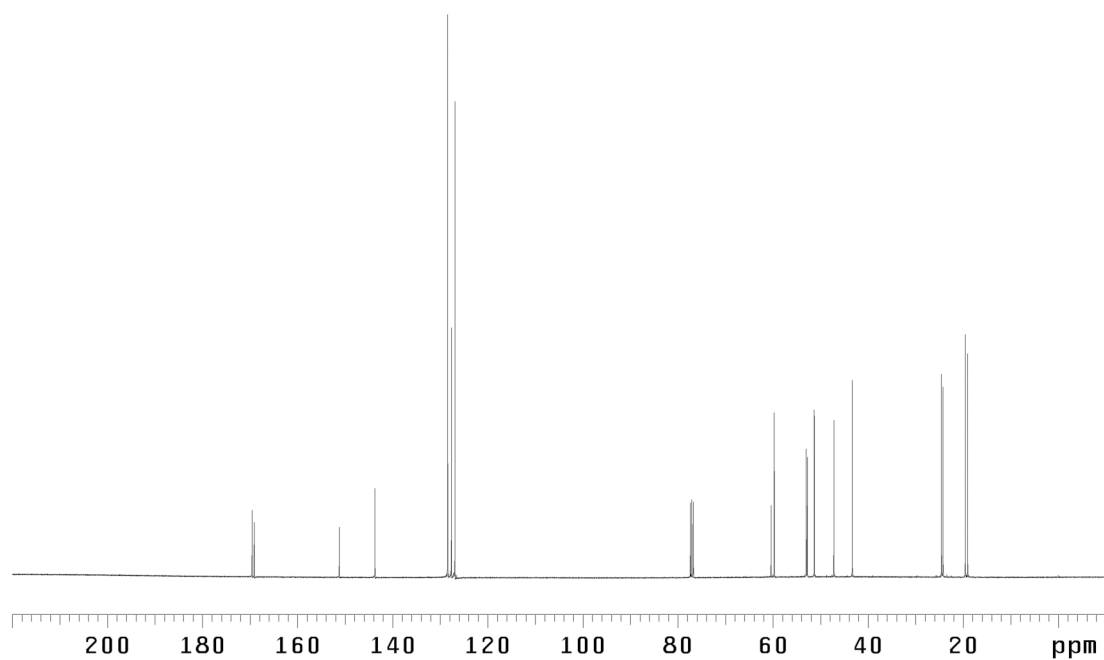


Figure A2.84 ¹³C NMR (101 MHz, CDCl₃) of compound **60**

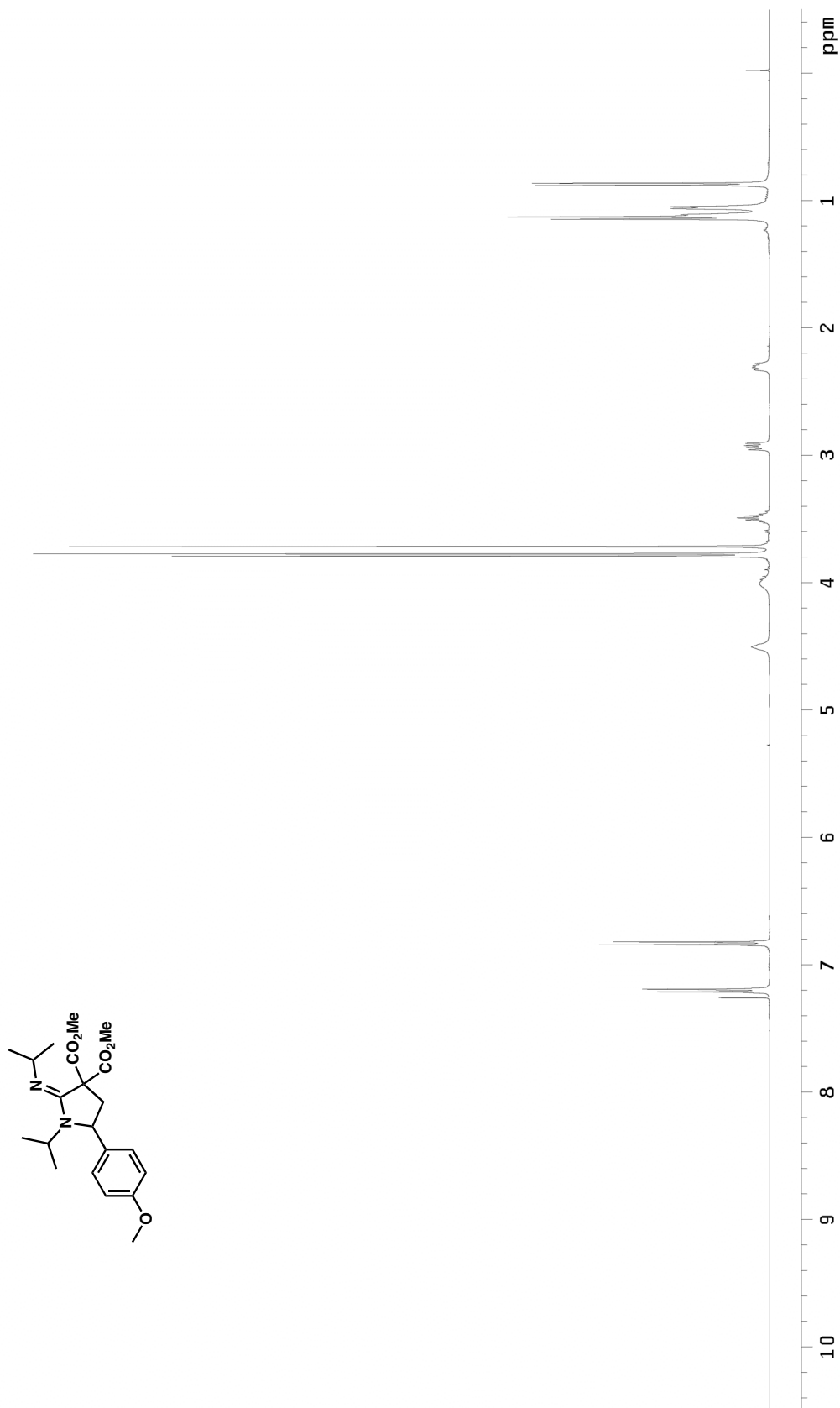


Figure A2.85 ¹H NMR (400 MHz, CDCl₃) of compound **61**

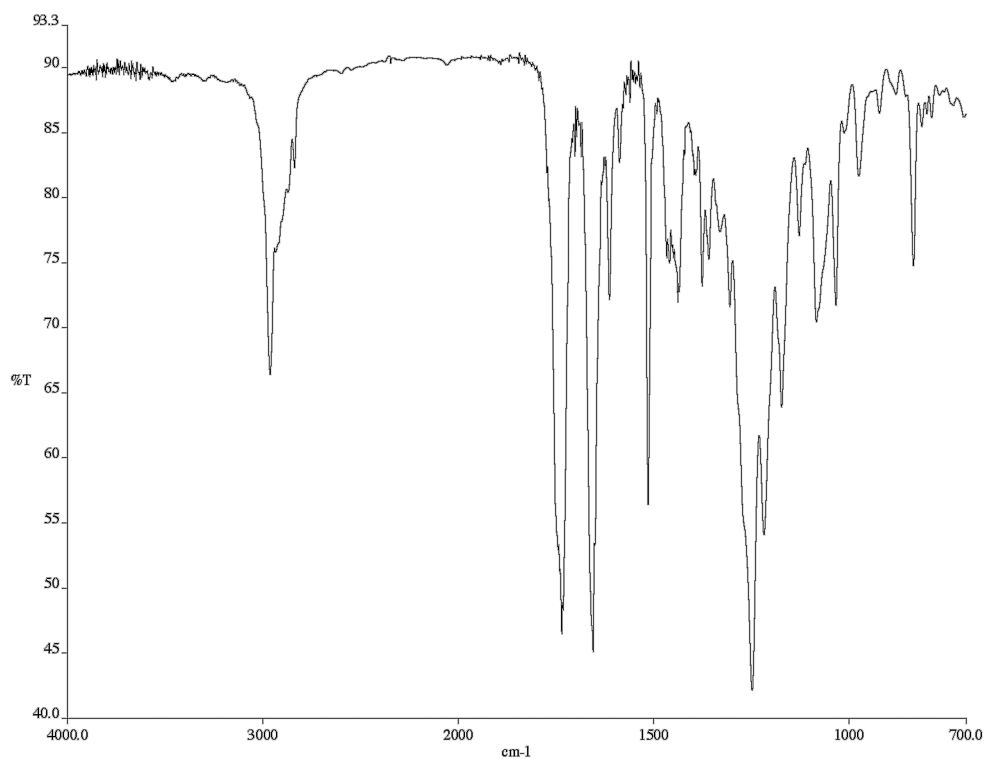


Figure A2.86 Infrared spectrum (thin film/NaCl) of compound **61**

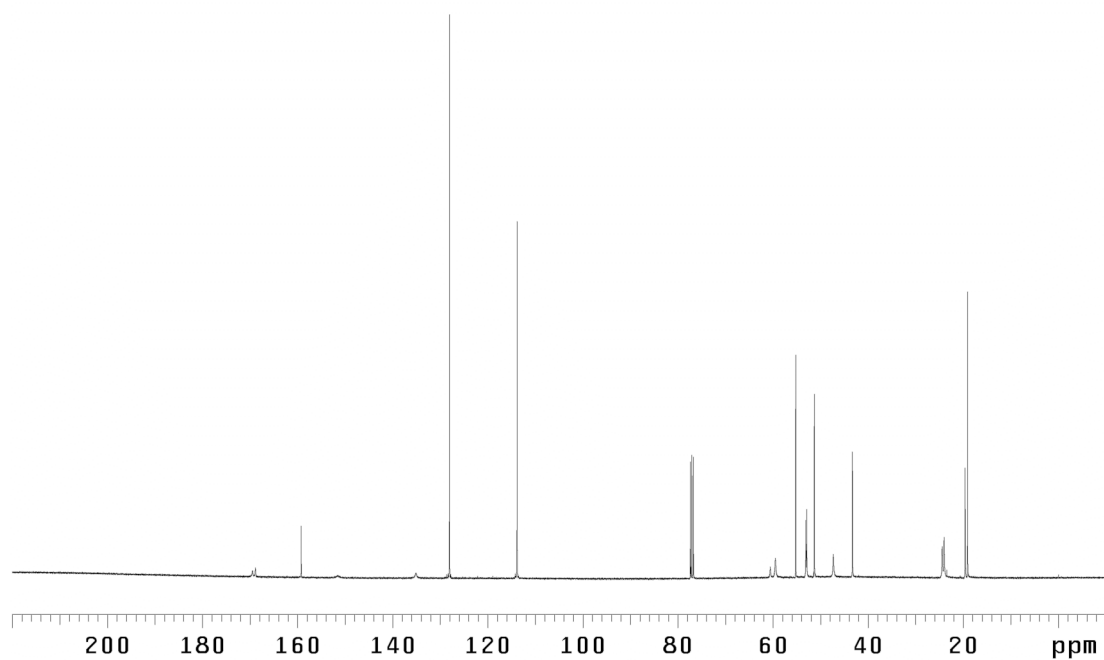


Figure A2.87 ¹³C NMR (101 MHz, CDCl₃) of compound **61**

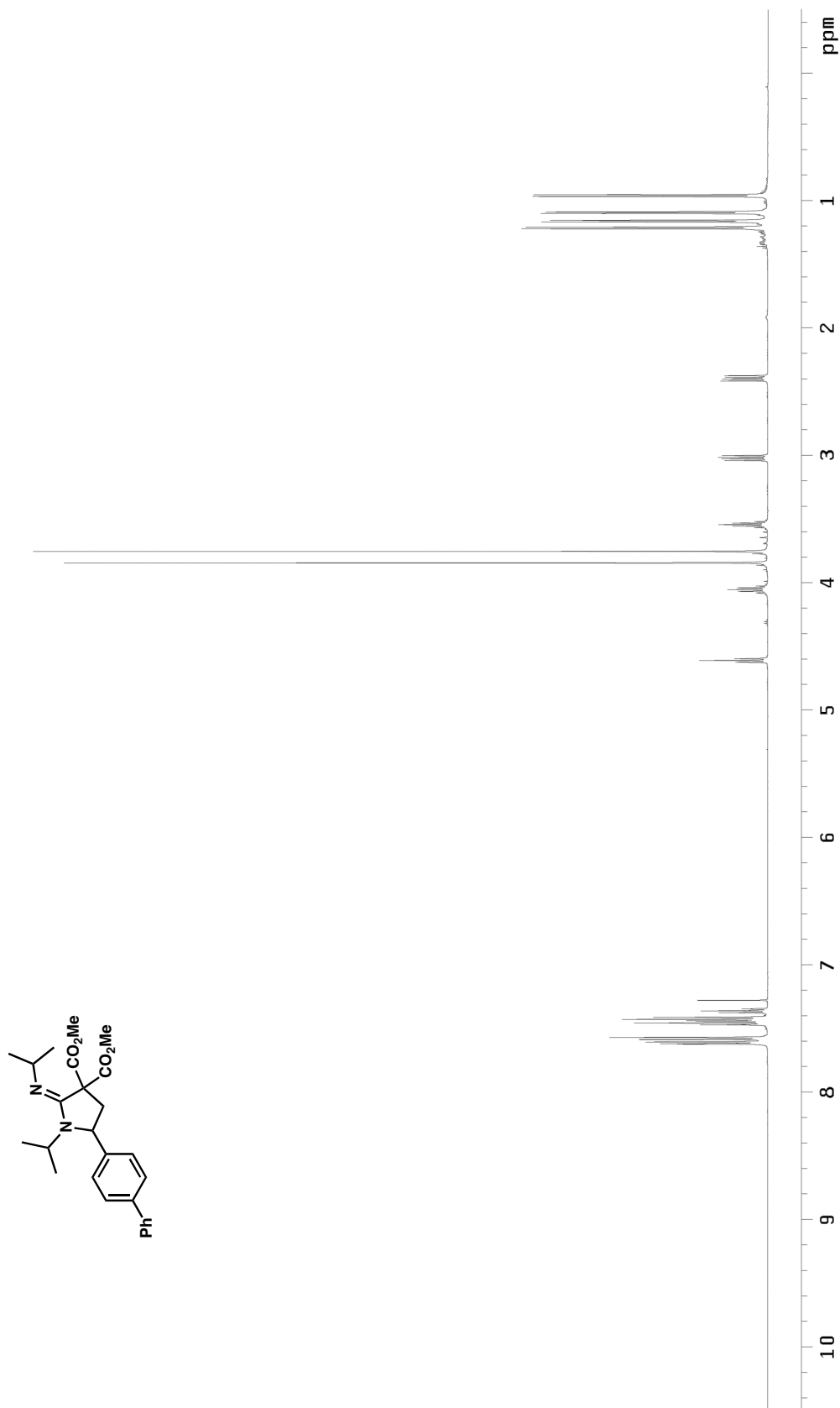


Figure A2.88 ^1H NMR (500 MHz, CDCl_3) of compound **62**

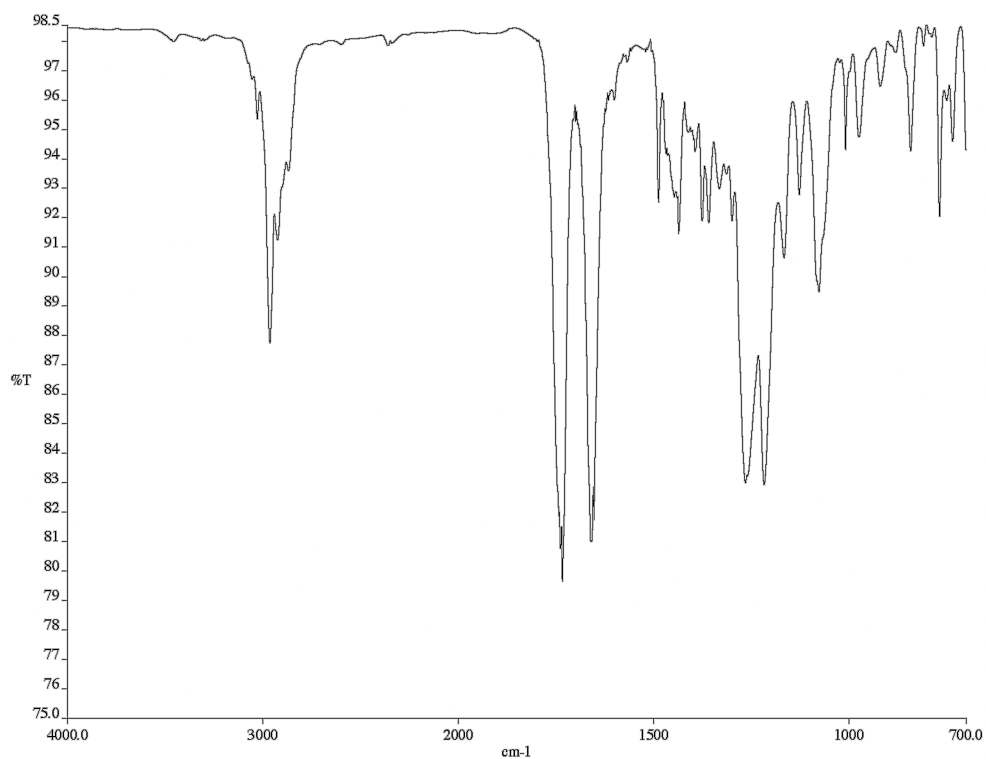


Figure A2.89 Infrared spectrum (thin film/NaCl) of compound **62**

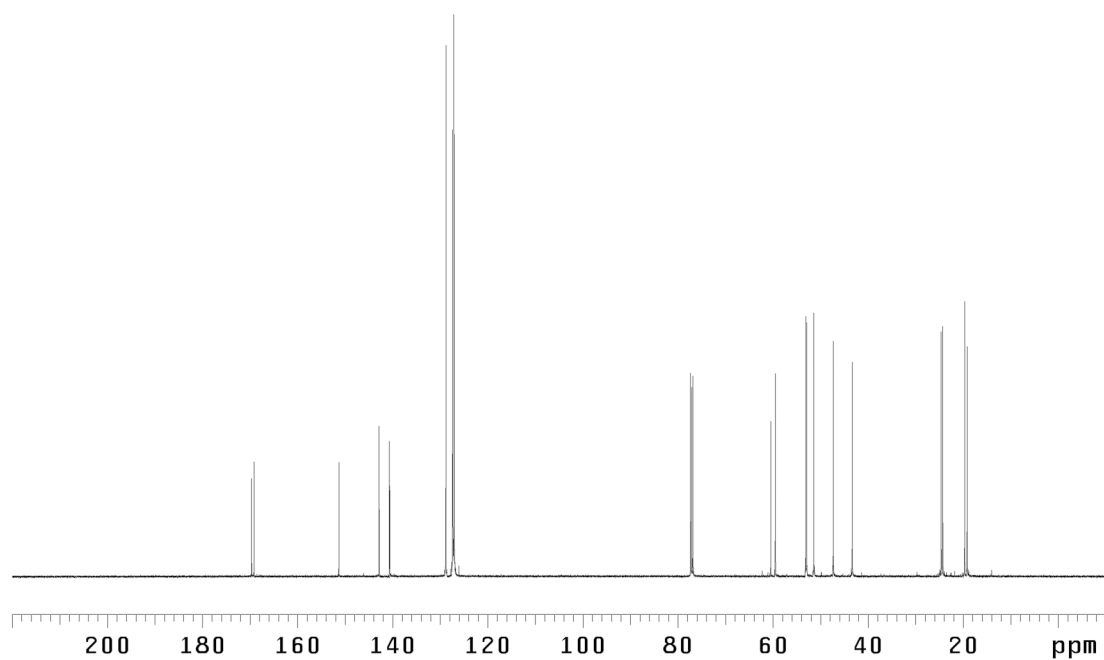


Figure A2.90 ¹³C NMR (126 MHz, CDCl₃) of compound **62**

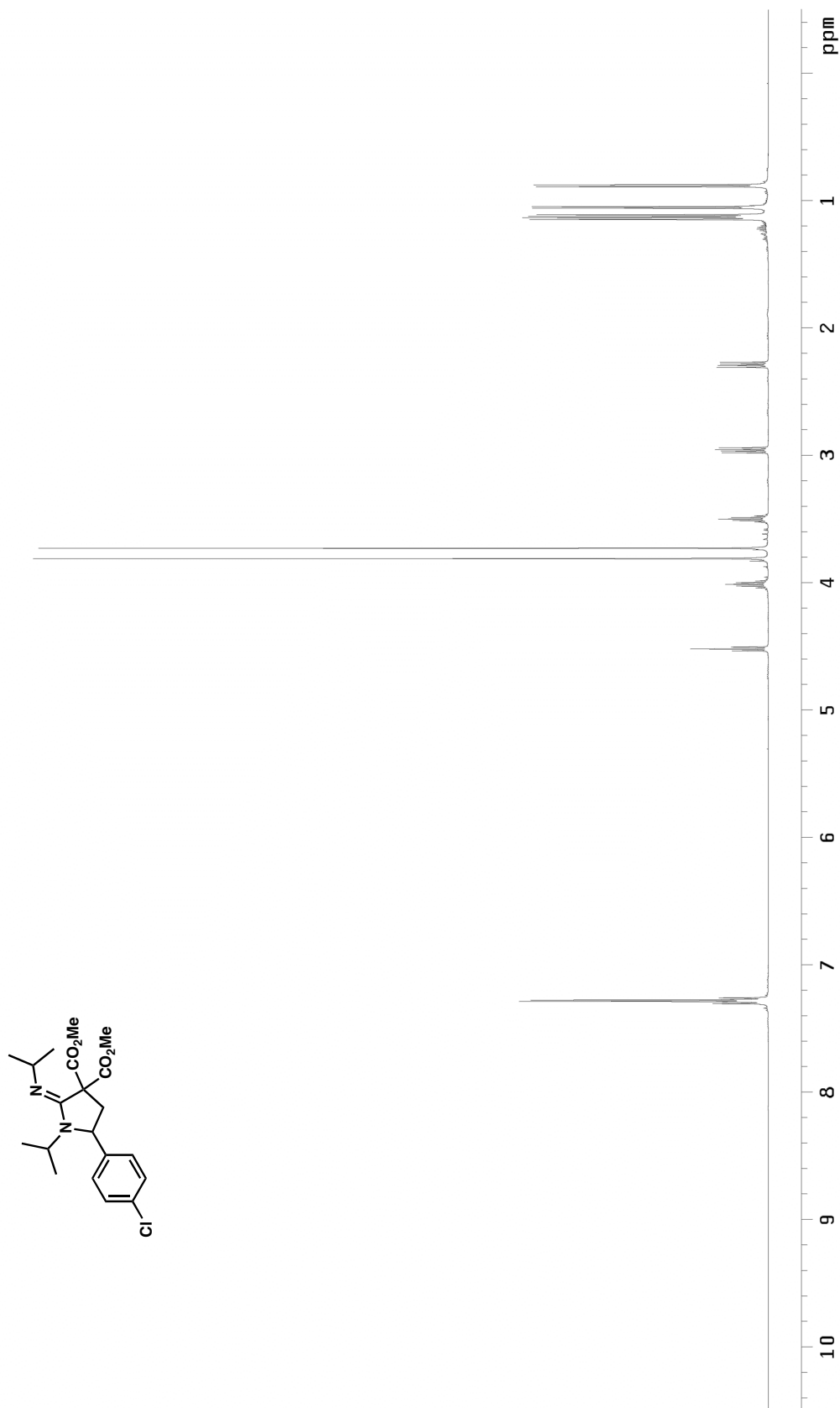


Figure A2.91 ¹H NMR (500 MHz, CDCl₃) of compound **63**

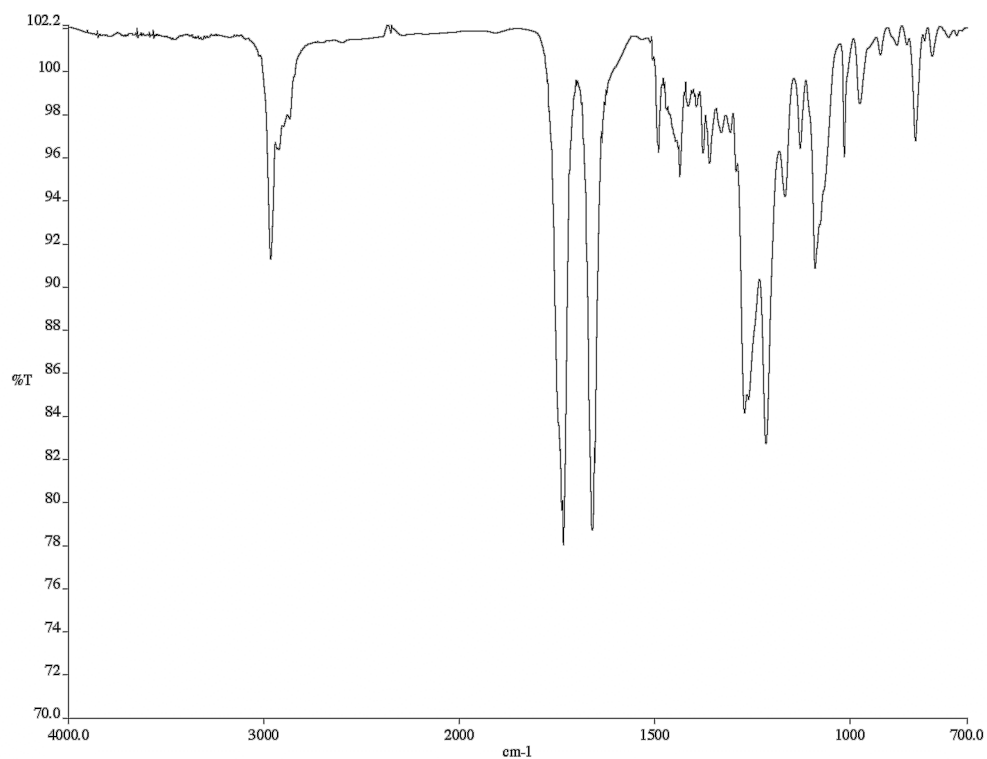


Figure A2.92 Infrared spectrum (thin film/NaCl) of compound **63**

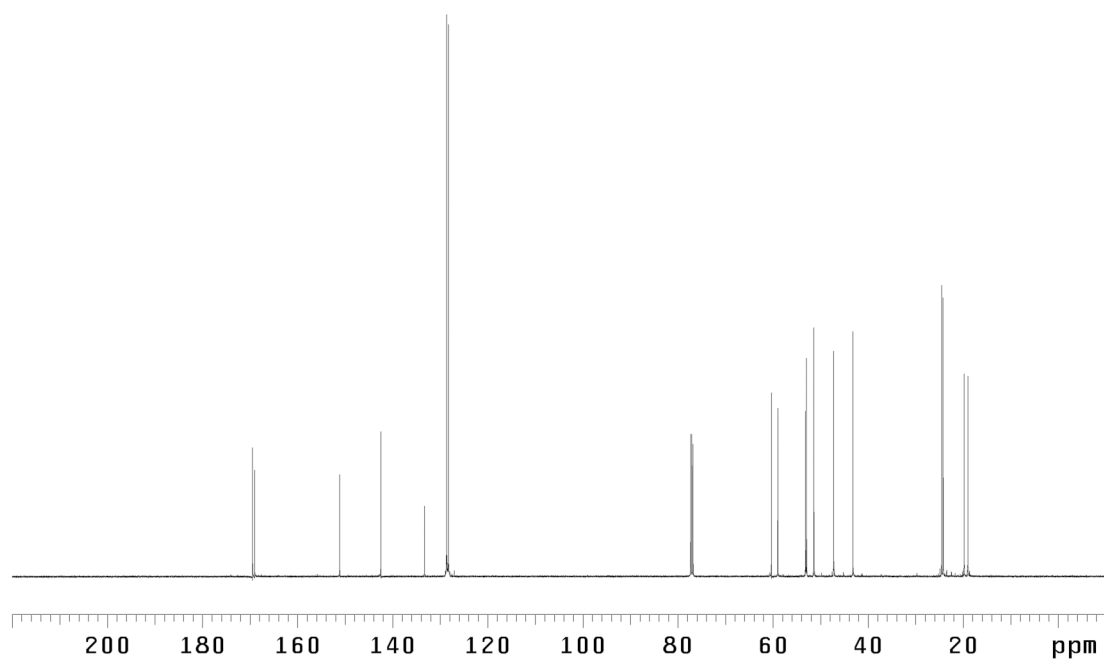


Figure A2.93 ¹³C NMR (126 MHz, CDCl₃) of compound **63**

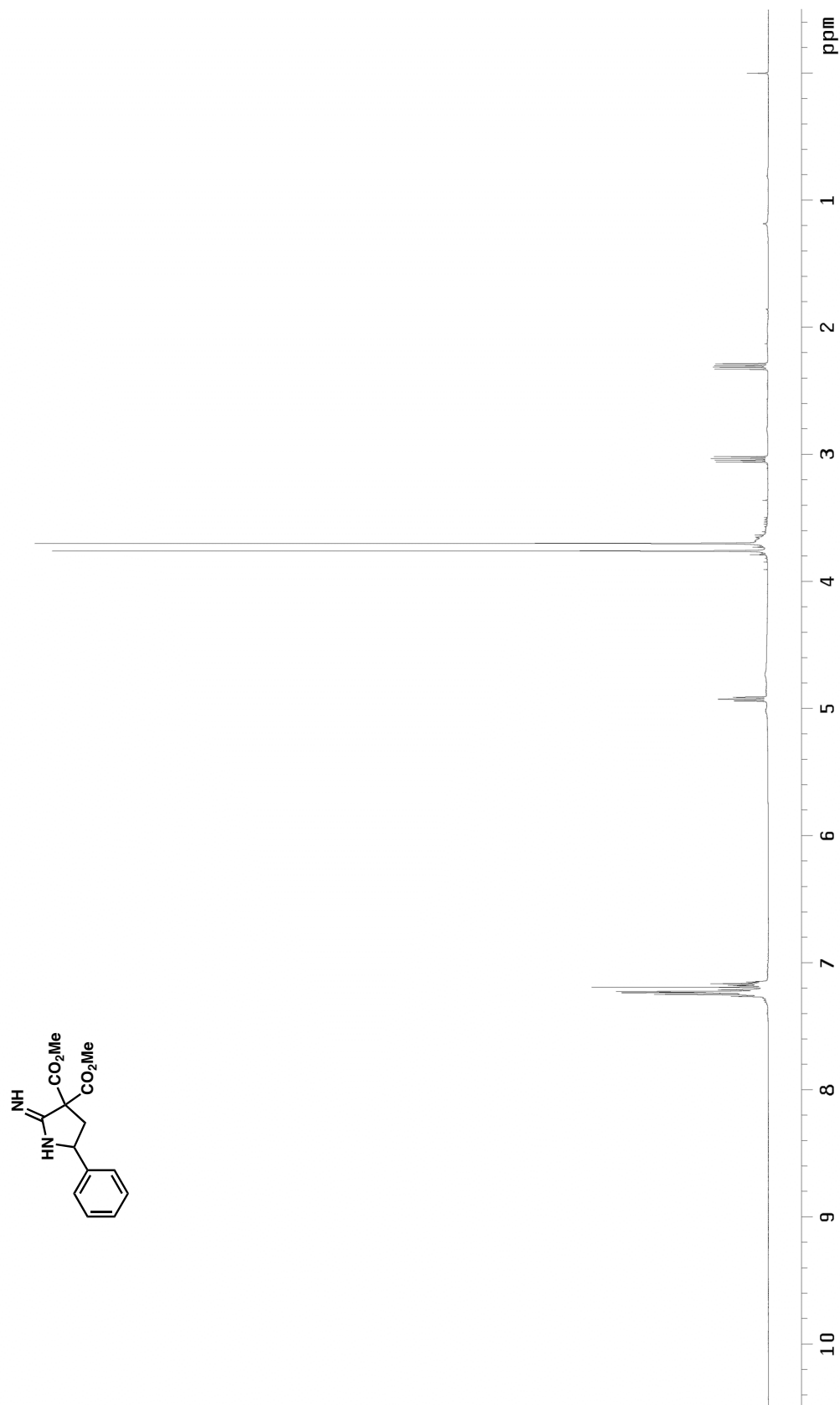


Figure A2.94 ¹H NMR (500 MHz, CDCl₃) of compound **64**

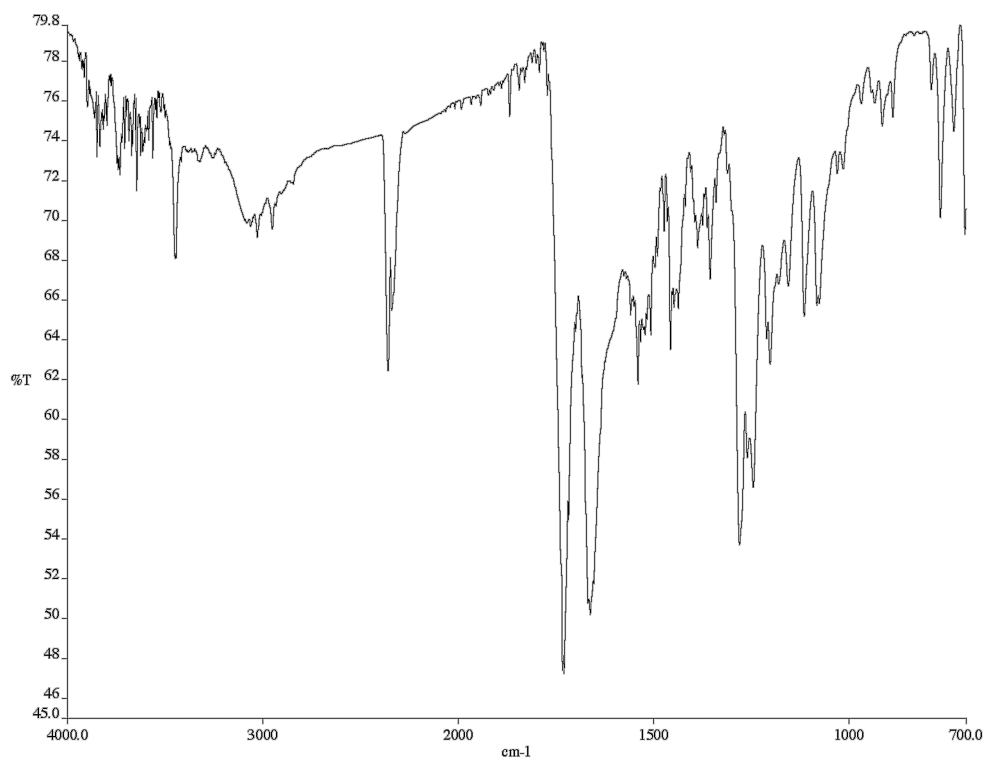


Figure A2.95 Infrared spectrum (thin film/NaCl) of compound **64**

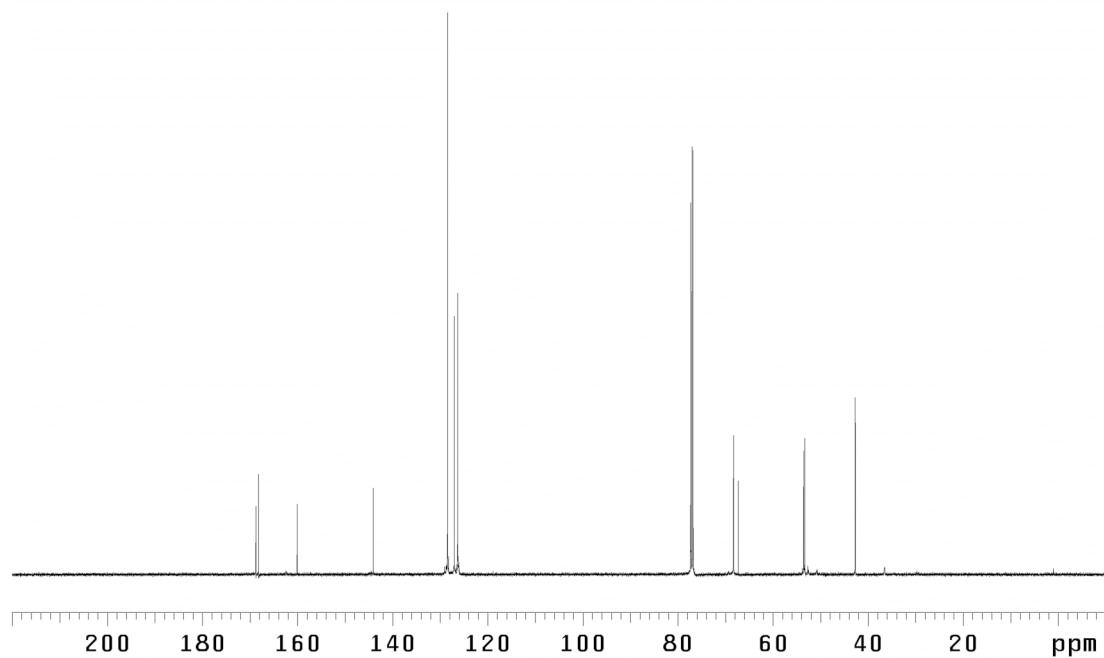


Figure A2.96 ¹³C NMR (126 MHz, CDCl₃) of compound **64**

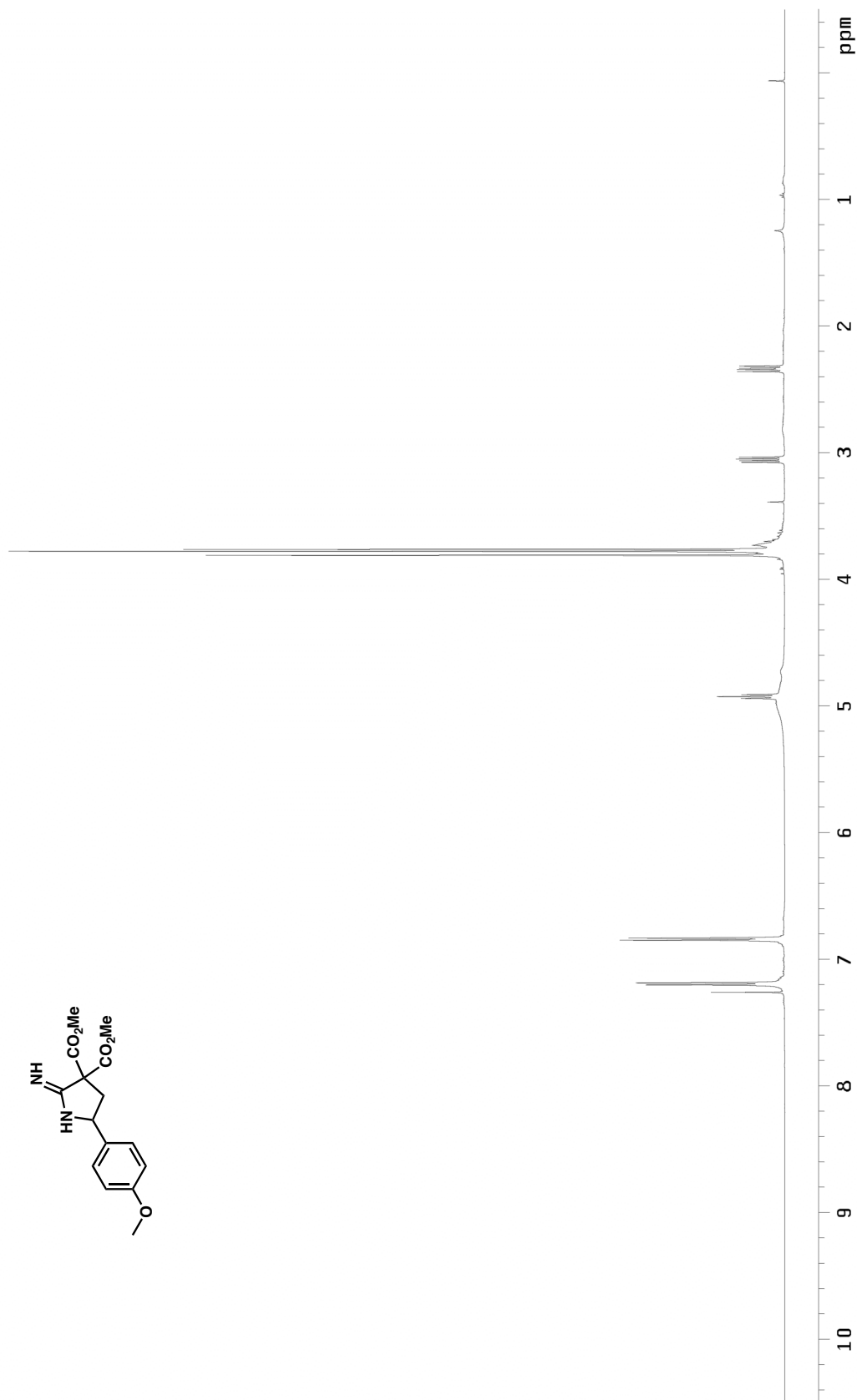


Figure A2.97 ¹H NMR (500 MHz, CDCl₃) of compound **65**

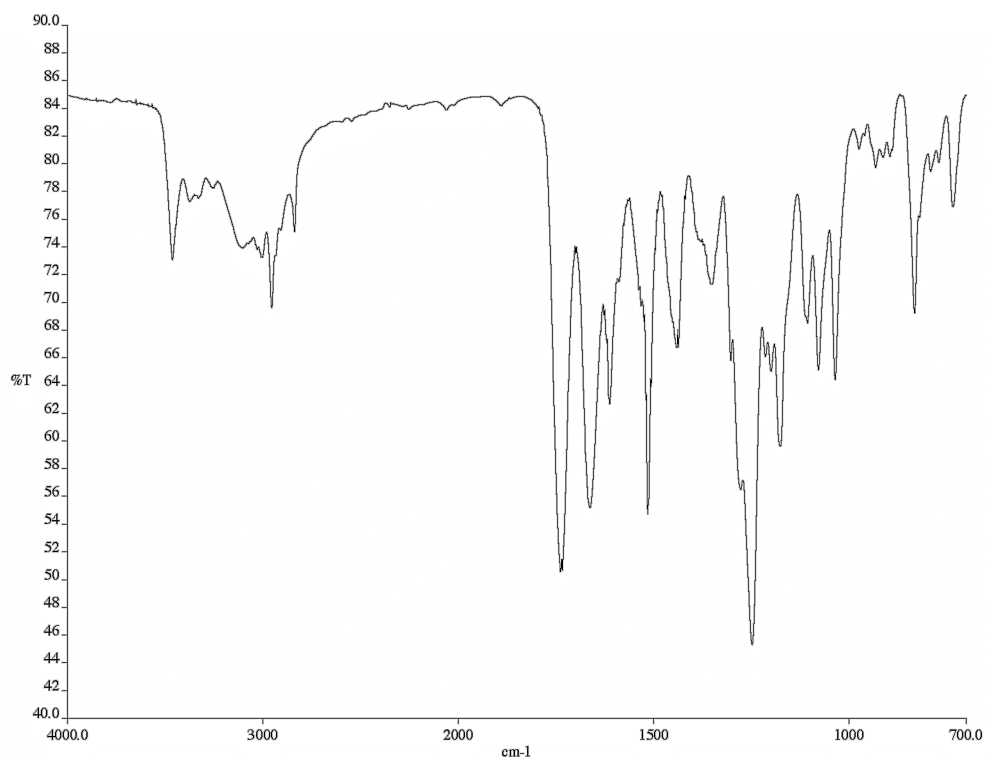


Figure A2.98 Infrared spectrum (thin film/NaCl) of compound **65**

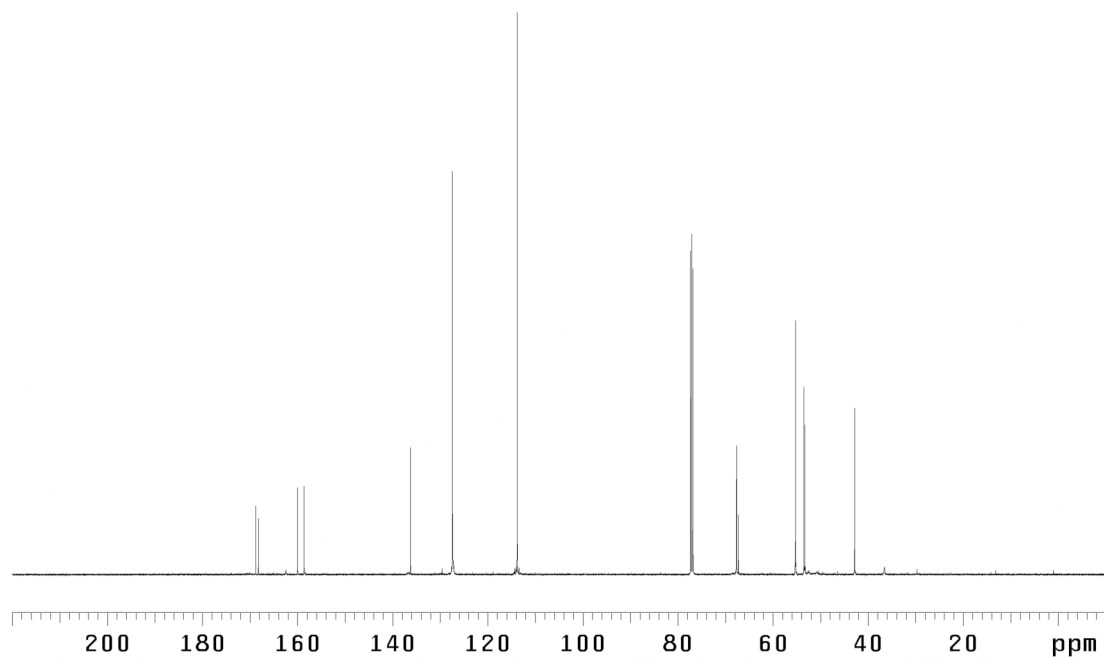


Figure A2.99 ^{13}C NMR (126 MHz, CDCl_3) of compound **65**

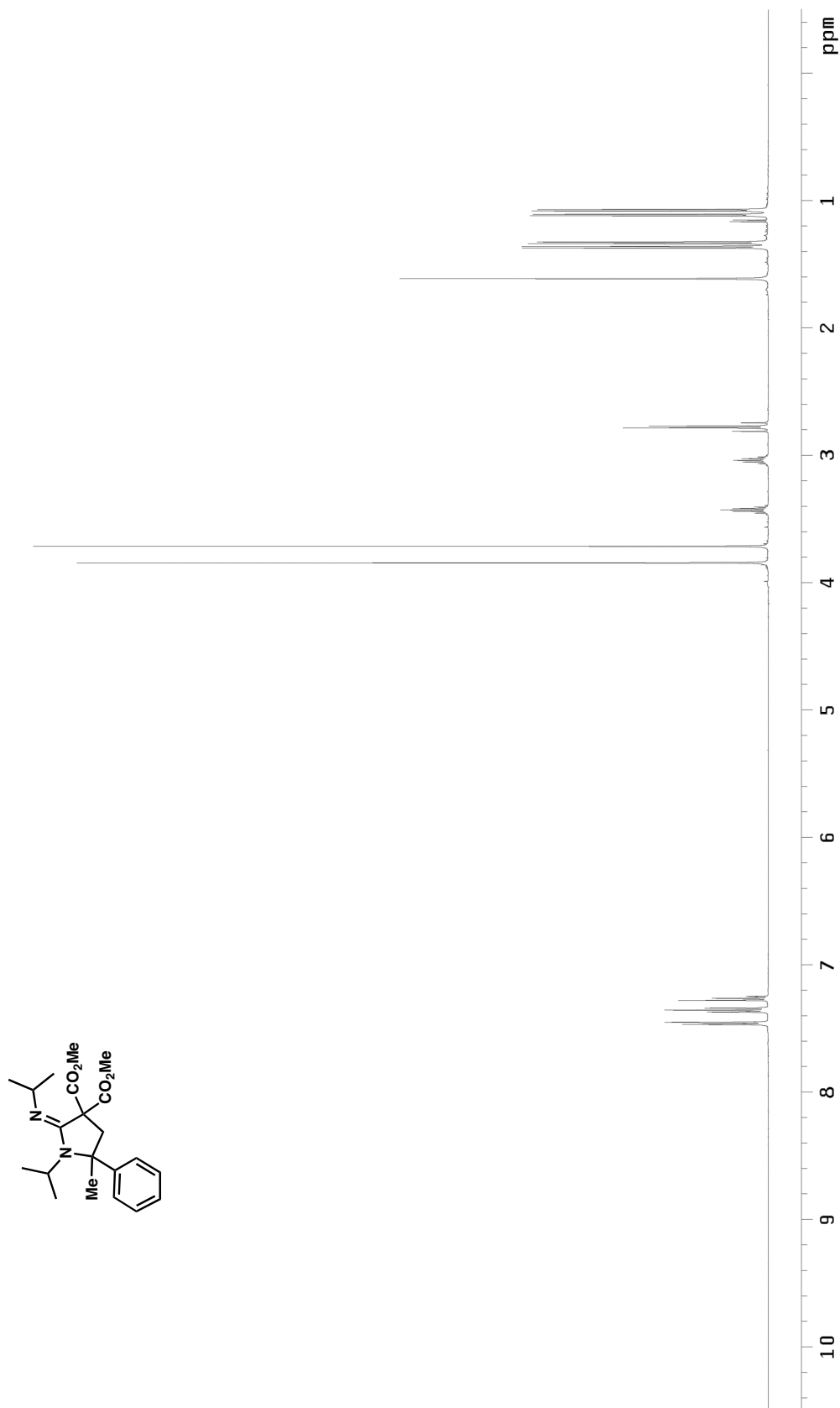


Figure A2.100 ¹H NMR (500 MHz, CDCl₃) of compound **66**

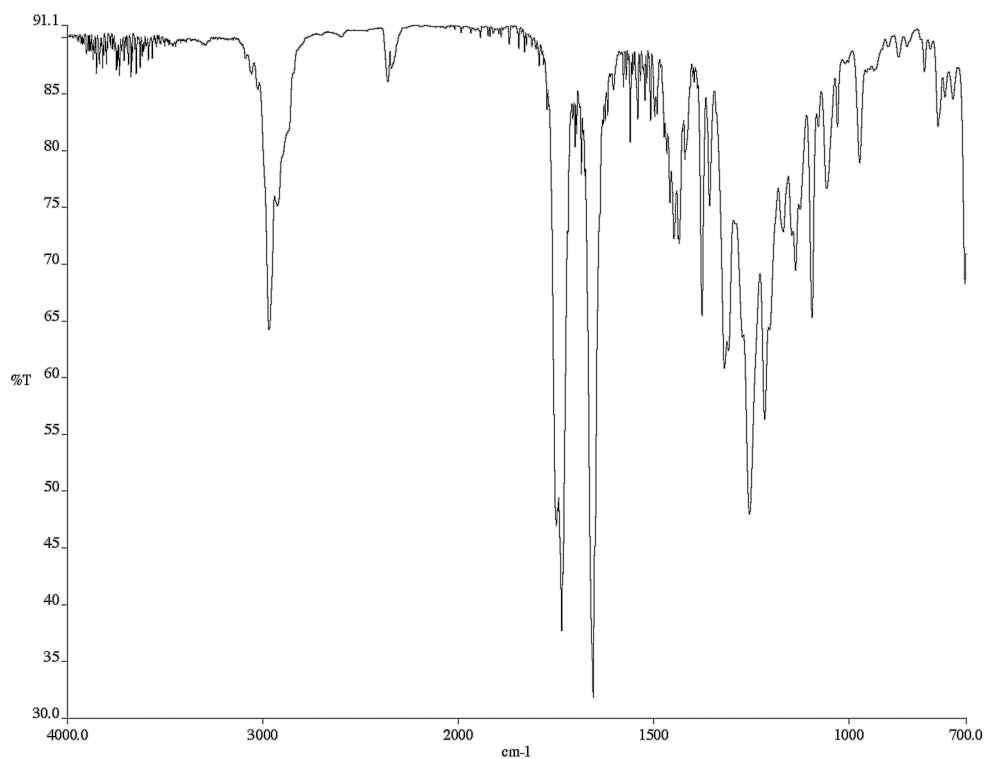


Figure A2.101 Infrared spectrum (thin film/NaCl) of compound **66**

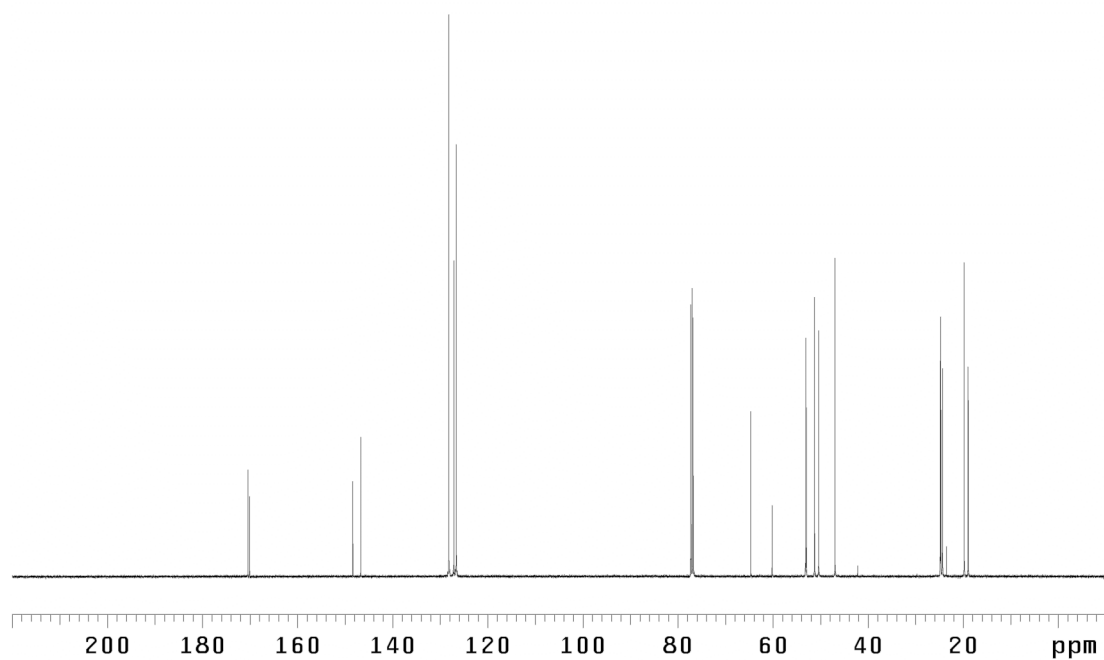


Figure A2.102 ¹³C NMR (126 MHz, CDCl₃) of compound **66**

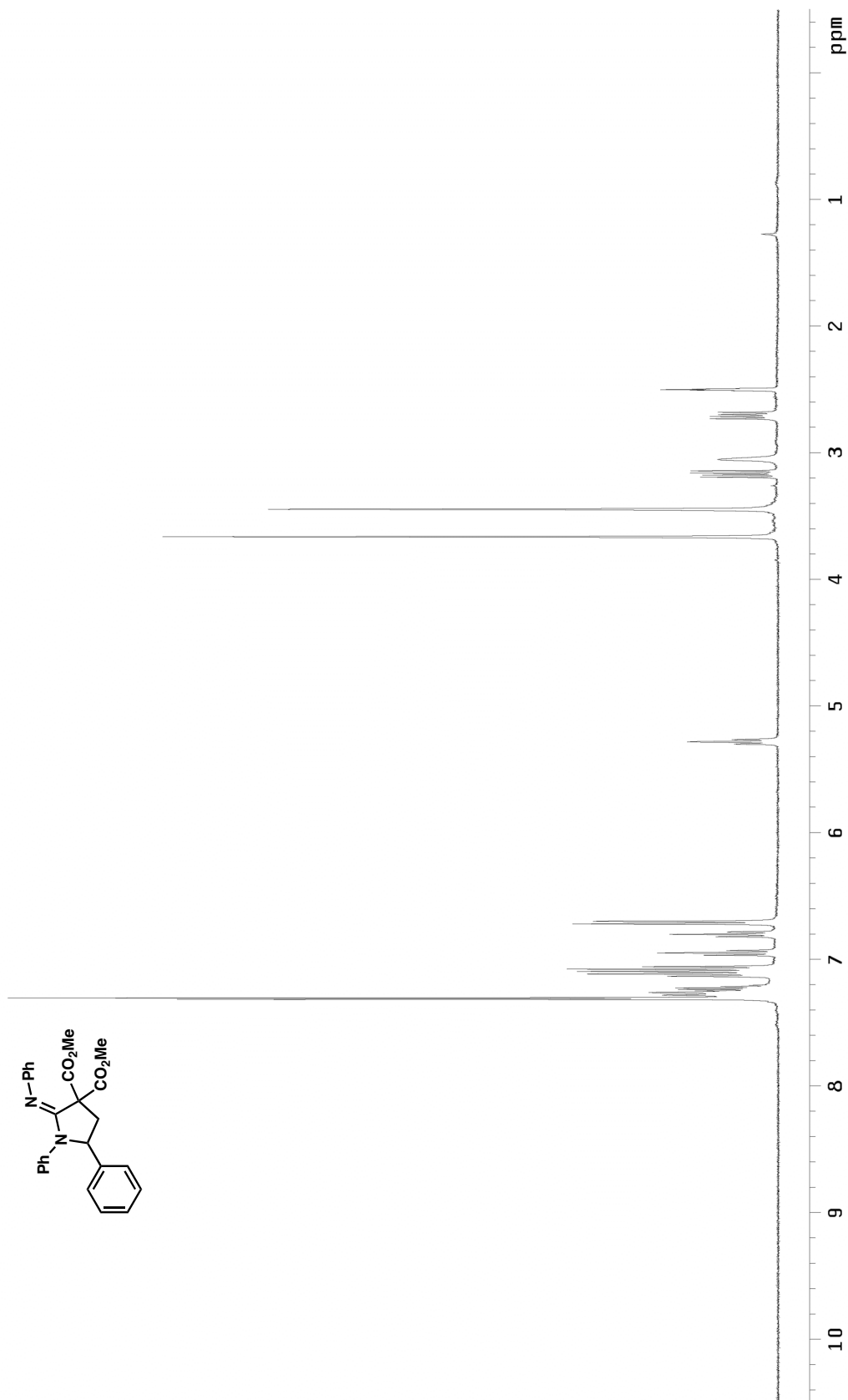


Figure A2.103 ¹H NMR (400 MHz, DMSO-d₆, 80 °C) of compound **67**

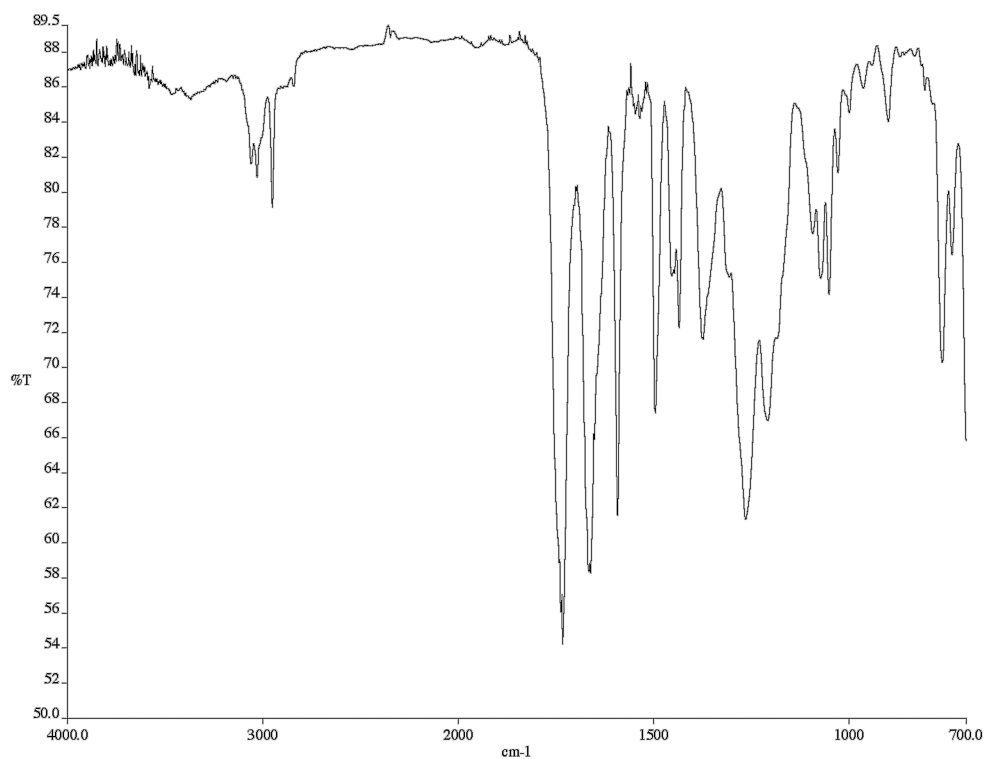


Figure A2.104 Infrared spectrum (thin film/NaCl) of compound **67**

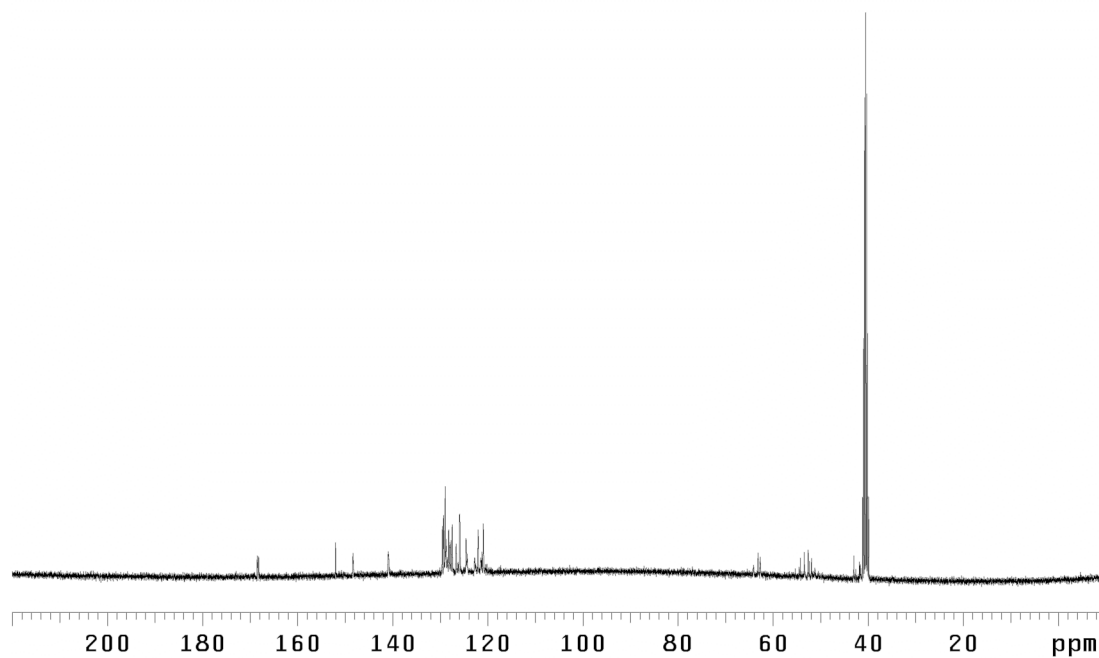


Figure A2.105 ¹³C NMR (101 MHz, DMSO-d₆, 100 °C) of compound **67**